FINAL

FOURTH FIVE-YEAR REVIEW REPORT

CERCLA SITES: SS026/OU-14, SS034/OU-20, SS035/OU-21, OT022/OU-26, OT024/OU-28, OT026/OU-29, SS040/OU-30, AND SS042/OU-31

FORMER HOMESTEAD AIR FORCE BASE
HOMESTEAD, FLORIDA
USEPA ID NO. FL7570024037

Air Force Civil Engineer Center
2261 Hughes Avenue, Suite 155,
Joint Base San Antonio Lackland, TX

September 2022

Approved by:

_____ Date:_____

Gregory G. Gangnuss, GS-15, DAF
Chief, BRAC Program Management Division
Installation Directorate
Air Force Civil Engineer Center

Approved by:

_____ Date:_____

Randall Chaffins
Acting Director
Superfund & Emergency Management Division
US EPA, Region 4

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LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AFCEC	Air Force Civil Engineer Center
AFRC	Air Force Reserve Command
ARB	Air Reserve Base
AST	Aboveground Storage Tank
B(a)P	Benzo(a)pyrene
bgs	below ground surface
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
DAFI	Department of Air Force Instruction
DCE	cis-1,2-dichloroethene
ESD	Explanation of Significant Differences
EURC	Environmental Use Restrictive Covenant
°F	Fahrenheit
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FS	Feasibility Study
ft	feet or foot
FYR	Five-Year Review
GCTL	Groundwater Cleanup Target Level
IRA	Interim Remedial Action
IRP	Installation Restoration Program
lbs	pounds
LUC	Land Use Control
MCL	Maximum Contaminant Level
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MNA	Monitoring Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NGVD	National Geodetic Vertical Datum
NPL	National Priorities List

OU	Operable Unit
OWS	Oil/Water Separator
PAH	Polycyclic Aromatic Hydrocarbons
PCE	tetrachloroethene
ppm	parts per million
RA	Remedial Action
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigations
RG	Remedial Goal
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SI	Site Investigation
SWMU	Solid Waste Management Unit
T&ES	Threatened and Endangered Species
TCE	Trichloroethylene
TRPH	Total Recoverable Petroleum Hydrocarbons
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UU/UE	Unlimited Use/Unrestricted Exposure
VC	vinyl chloride
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

The United States Air Force (USAF), in consultation with the United States Environmental Protection Agency (USEPA) Region 4, conducted the Fourth Five-Year Review (FYR) for the Former Homestead Air Force Base (AFB), Homestead, Florida. This Fourth FYR covers the review period from December 7, 2020 – August 16, 2021. FYRs are conducted pursuant to Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, consistent with Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The purpose of a FYR is to evaluate the implementation and performance of a remedy to determine if the remedies are and will be protective of human health and the environment.

The Former Homestead AFB, USEPA facility identification number FL7570024037, was placed on the National Priorities List (NPL) in 1990 and remedial activities are being conducted under the Installation Restoration Program (IRP). In May 1990, the USAF, USEPA, and the State of Florida entered into a Federal Facilities Agreement (FFA) under Section 120 of CERCLA. After Hurricane Andrew in 1993, Homestead AFB was selected for closure by the Base Realignment and Closure (BRAC) Commission. In 1994, approximately one-third of the former installation was retained by the Department of Defense and became the Homestead Air Reserve Base (ARB) under the Air Force Reserve Command (AFRC). The retained property is referred to as the cantonment area. The remaining property was transferred to Miami-Dade County in 2006 for reuse and redevelopment. CERCLA Operable Units (OUs) within this property are managed by the Air Force Civil Engineer Center (AFCEC). This FYR only includes those sites managed by AFCEC. Sites located within the cantonment area will be addressed in a separate document and submitted by the AFRC. The CERCLA OUs detailed in the FYR are as follows:

- SS026/OU-14: Building 720
- SS034/OU-20: Outdoor Staging Area (Adjacent to Buildings 618 and 619)
- SS035/OU-21: Outdoor Area Adjacent to Building 618 and Base Supply Hazardous Materials Storage Facility (Building 619)
- OT022/OU-26: Aircraft Fabrication Shop
- OT024/OU-28 Propulsion Maintenance Facility
- OT026/OU-29: Avionics/Aircraft Ground Equipment Maintenance Facility
- SS040/OU-30: Contractor Storage Area, Former Building 767
- SS042OU-31: Non-Destructive Inspection Lab, Building 755

Records of Decision (ROD) have been signed by the USEPA and USAF for these eight CERCLA OUs. In addition, Explanation of Significant Differences (ESDs) for Sites OT022/OU-26, OT024/OU-28, and OT026/OU-29 were finalized in September 2013 and signed by the USEPA on February 6, 2014. The ESDs were prepared to formally document the inclusion of Land Use Controls (LUCs) as part of the remedy for each OU.

These OUs contain hazardous substances, pollutants, or contaminants remaining at the site above levels that would allow for unlimited use/unrestricted exposure (UU/UE). For this FYR, technical assessments were performed for each CERCLA OUs to verify the following:

1. Is the remedy functioning as intended?
2. Are the exposure assumptions, toxicity data, clean-up levels, and remedial action (RA) objectives still valid?
3. Has any other information come to light that could call into question the protectiveness of the remedy?

The technical assessment consisted of the review of site documents and data from January 2016 to January 2021 and the review of ROD requirements, exposure assumptions, toxicity data, and clean-up levels for each site.

Based upon the review of the CERCLA OUs at the Former Homestead AFB conducted by the USAF, the remedies remain protective of human health and the environment with the exception of OT024/OU-28, which is only protective of human health and the environment for the short term. The remedies also comply or are expected to comply with applicable or relevant and appropriate requirements and are reasonably cost effective. The remedial activities conducted, along with the LUCs included in the property transfer deed for the OUs, reduce the risk to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through LUCs and Additional RA field constraints (engineering controls and presence of Threatened and Endangered Species (T&ES)). An updated visual site inspection was conducted on December 7, 2020. LUC and field constraints inspections will continue at Sites SS026/OU-14, SS034/OU-20, SS035/OU-21, OT022/OU-26, OT024/OU-28, OT026/OU-29, SS040/OU-30, and SS042/OU-31 to confirm that use restrictions remain in place and are effective.

In addition to the CERCLA OUs above, a separate policy FYR was conducted on two compliance sites (OT020/OU-22 and COW006) that fall under the State of Florida Petroleum Cleanup Program. The policy FYR for these sites was conducted in accordance with Department of the Air Force Instruction (DAFI) 32-7020_DAFGM2023-01 and is included as **Attachment 1**. This policy review will be the First FYR conducted for these two sites.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Former Homestead Air Force Base		
USEPA ID: FL7570024037		
Region: 4	**State:** Florida	**City/County:** Homestead/Miami-Dade
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
Construction completion date: September 29, 2006		
REVIEW STATUS		
Agency: USAF		
Author name (Federal or State Project Manager): Robert L. Estrada Jr.		
Author affiliation: Air Force Civil Engineer		
Review period: December 7, 2020 – August 16, 2021		
Date of site inspection: December 7, 2020		
Type of review: Statutory		
Review number: 4		
Triggering action date: January 12, 1996		
Due date *(five-year intervals after triggering action date)*: January 12, 2021		

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): OT024/OU-28	**Issue Category: Remedy Performance**			
	Issue: An unknown oil/water separator (OWS) was discovered during the Additional RA completed in 2018 and 2019.			
	Recommendation: An Additional RA for removing the unknown OWS and any contaminated soils above the Florida Department of Environmental Protection (FDEP) Commercial/Industrial Soil Cleanup Target Levels (SCTLs) is recommended.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	USAF	USEPA	1/12/2026
OU(s): SS026/OU-14	**Issue Category: Remedy Performance**			
	Issue: While the site is included in Parcel 11E, the revised LUC site boundaries now extend into Parcel 11.			
	Recommendation: It is recommended that the revised Site SS026/OU-14 LUC site boundaries be accounted for during any future transfer of Parcel 11 property adjacent to the previously defined site boundary in the Parcel 11E deed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	No	USAF	USEPA	1/12/2021

Protectiveness Statement(s)		
Former Homestead Air Force Base	*Protectiveness Determination:* Short-term Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The selected remedies at the Former Homestead AFB OUs are protective of human health and the environment based on the ongoing LUCs in place at the site. However, in order for the remedy to be protective in the long-term, the removal of a previously unidentified OWS at Site OT024/OU-28 needs to be completed to ensure protectiveness.		
Operable Unit: Site SS026/OU-14	*Protectiveness Determination:* Protective	*Addendum Due Date (if applicable):*
Protectiveness Statement: The remedy at Site SS026/OU-14 is protective of human health and the environment.		

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site SS034/OU-20	Protective	
Protectiveness Statement: The remedy at Site SS034/OU-20 is protective of human health and the environment.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site SS035/OU-21	Protective	
Protectiveness Statement: The remedy at Site SS035/OU-21 is protective of human health and the environment.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site OT022/OU-26	Protective	
Protectiveness Statement: The remedy at Site OT022/OU-26 is protective of human health and the environment.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site OT024/OU-28	Short-term Protective	
Protectiveness Statement: The selected remedy at Site OT024/OU-28 is protective of human health and the environment based on the ongoing LUCs in place at the site. However, for the remedy to be protective in the long-term, the removal of a previously unidentified OWS need to be completed to ensure protectiveness.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site OT026/OU-29	Protective	
Protectiveness Statement: The remedy at Site OT026/OU-29 is protective of human health and the environment.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site SS040/OU-30	Protective	
Protectiveness Statement: The remedy at Site SS040/OU-30 is protective of human health and the environment.		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
Site SS042/OU-31	Protective	
Protectiveness Statement: The remedy at Site SS042/OU-31 is protective of human health and the environment.		

1.0 INTRODUCTION

This Fourth FYR has been developed for the following eight CERCLA OUs: Sites SS026/OU-14, SS034/OU-20, SS035/OU-21, OT022/OU-26, OT024/OU-28, OT026/OU-29, SS040/OU-30, and SS042/OU-31 located within Parcel 11E of the Former Homestead AFB, Homestead, Florida. (**Figure 1**).

The USAF, as the lead agency, is preparing this FYR report pursuant to CERCLA §121 and the NCP. CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP, 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The triggering action for this statutory review for the Former Homestead AFB was RA construction at OU-6[1], which began January 12, 1996. In accordance with the Homestead AFB FFA, review of operable units will be conducted every five years counting from the initiation of the first operable unit, until initiation of the final remedial action for the Site. As such, the completion date for this Fourth FYR is January 12, 2021. The FYR is required because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for UU/UE. This FYR was performed in a manner consistent with the following USEPA guidance documents (USEPA, 2001 and USEPA, 2011):

- *Comprehensive Five-Year Review Guidance, Office of Emergency and Remedial Response (5204G), USEPA 540-R-01-007, Office of Solid Waste Emergency Response No. 9355.7-03B-P, June 2001.*
- *Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance, September 2011.*

The First FYR, Second FYR, and Third FYR reports were approved by USEPA on August 25, 2005, September 29, 2011, and September 29, 2016, respectively. This Fourth FYR report documents the results of the 2020 review and incorporates data and information developed since

[1] OU-6 achieved site closure in 1999 (Air Force Real Property Agency, 2003).

submittal of the Third FYR. Appendices for the FYR include: the Former Homestead AFB LUC Implementation Instruments (**Appendix A**), the Site Inspection Checklists and Photographs (**Appendix B**), the Public Notice Copy of Advertisement and Affidavit (**Appendix C**), and the USEPA Approval Letter for this Fourth FYR (**Appendix D**).

In addition, a separate, policy review presents methods, findings, conclusions, and recommendations for two State of Florida Petroleum Cleanup Program sites which are also located at the Former Homestead AFB. These include Site OT020/OU-22 (former Units 12 and 15, Building 761, Aerospace Ground Equipment Maintenance Facility, and Building 764) and Site COW006 (Building 741 OWS). The review for these sites was conducted in accordance with DAFI 32-7020_DAFGM2023-01, which is included in **Attachment 1**.

1.1 PURPOSE OF REVIEW

The purpose of conducting a FYR is to evaluate the implementation and performance of a remedy to determine if it is, and will continue to be, protective of human health and the environment. This report presents the methods, findings, conclusions, and recommendations for the eight CERCLA OUs. An objective is also to identify and provide recommendations for any issues of concern associated with implemented response actions. 42 USC § 9621(c) of CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and Section 300.430(f)(4)(ii) of the NCP mandate that a post-SARA RA be reviewed no less than every five years after initiation of the RA at sites where hazardous substances, pollutants, or contaminants remain at levels above those that allow for UU/UE.

1.2 SITE OVERVIEW

The Former Homestead AFB is located approximately 25 miles south of Miami in southeastern Miami-Dade County, east of the City of Homestead, and west of Biscayne Bay. The former military installation covered 2,938 acres, and approximately one-third of the original base comprises the cantonment area, which has been retained for military use by the AFRC as Homestead ARB. The remainder of the property was deeded to Miami-Dade County for reuse and redevelopment. Sites discussed in this Fourth FYR are located outside of the cantonment area and are managed by AFCEC (**Figure 1**). These sites, presented below, are located in Parcel 11 and/or Parcel 11E which have been designated for commercial/industrial land use per environmental covenants included in the transfer documentation. The Parcel 11 and 11E deeds are provided in **Appendix A**. Currently the property has mixed industrial use and vacant areas. Specific land use per site is included in **Sections 3** through **10**.

- SS026/OU-14 Building 720
- SS034/OU-20 Outdoor Staging Area (Adjacent to Buildings 618 and 619)
- SS025/OU-21 Outdoor Area Adjacent to Building 618 and Base Supply Hazardous Materials Storage Facility (Building 619)
- OT022/OU-26 Aircraft Fabrication Shop
- OT024/OU-28 Propulsion Maintenance Facility
- OT026/OU-29 Avionics/Aircraft Ground Equipment Maintenance Facility
- SS040/OU-30 Contractor Storage Area, Former Building 767

- SS042/OU-31 Non-Destructive Inspection Lab, Building 755.

1.3 FIVE-YEAR REVIEW PROCESS

1.3.1 Administrative Components

Members of the Base Realignment and Closure Cleanup Team (BCT) were informed that inspections of the sites were to be conducted. The visual site inspections were conducted on December 7, 2020, to physically confirm that the RAs undertaken are functioning as intended and remain protective of human health and the environment. The public was notified prior to initiating the FYR through the Miami Herald on January 24, 2021. Copies of the Advertisement and Affidavit are provided in **Appendix B**. Upon completion of the FYR, the USAF will make the completed report accessible to the public at the following Air Force Civil Engineer Center (AFCEC) Administrative Record website: https://ar.afcec-cloud.af.mil. .

1.3.2 Community Notification and Involvement

The USAF has a public participation program at the Former Homestead AFB to promote public understanding of the cleanup process and its results and to ensure that the community's concerns are solicited, considered, and thoroughly addressed. The public has access to current and historical information regarding environmental restoration activities at the Former Homestead AFB through the Information Repository. The Information Repository is the United States AFCEC Administrative Record and it is located at https://ar.afcec-cloud.af.mil.. Included in the repository are technical documents such as investigation and RA work plans and reports, as well as ongoing Annual Land Use Control (LUC) Site Inspection Reports and Biennial Groundwater Monitoring Reports reviewed for this FYR. As stated above, the public was notified prior to initiating the FYR. An additional public notice through the Miami Herald will be published upon completion of the FYR.

1.3.3 Interviews

Informal interviews and discussions with representatives from USEPA, FDEP, Miami-Dade County, Homestead ARB and AFCEC are held during regular semi-annual BRAC Cleanup Team meetings/teleconferences that have taken place since the last FYR was completed. The status of the sites and the LUCs are presented during these meetings. The last teleconference was held on September 14, 2020. Interviews with representatives of the property owner was also completed through email in association with this review. The interviews were conducted to obtain information on potential land-use changes and to confirm that the property owner is aware and compliant with LUCs implemented at the site.

2.0 SITE BACKGROUND

This chapter provides a description of the site history, previous investigations, and characteristics of the Former Homestead AFB.

2.1 SITE HISTORY

In September 1942, Homestead AFB opened as the Homestead Army Airfield. The Homestead AFB is located 25 miles south of Miami, Florida. In October 1945, the property was transferred to the Dade County Port Authority, which retained possession until 1953. The runways were used by crop dusters and the buildings housed a few small industrial and commercial operations. In 1953, the federal government again acquired the installation and rebuilt it as a Strategic Air Command Base. Base operations consisted of flight training, electronic weaponry, fabrication, fuel storage, missile testing, and vehicle/aircraft maintenance.

The Former Homestead AFB, USEPA facility identification number FL7570024037, was placed on the NPL in 1990 and remedial activities are being conducted under the IRP. In May 1990, the USAF, USEPA, and the State of Florida entered into a FFA under Section 120 of CERCLA. In accordance with the FFA, the environmental restoration lead agency is the USAF. As supporting agencies, the USEPA and FDEP provide primary oversight of the environmental restoration actions, in accordance with the FFA. The FFA provides a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions in accordance with CERCLA, the Resource Conservation and Recovery Act (RCRA) and the NCP, and applicable Florida Statutes and regulations.

In August 1992, Hurricane Andrew (Category 5 storm) caused extensive damage to the Base. The 1993 Defense BRAC Commission recommended the realignment of Homestead AFB as an AFRC installation, utilizing approximately one-third of the base property as Homestead ARB. The remainder of the property was deeded to Miami-Dade County for reuse and redevelopment. The Base was formally closed as Homestead AFB on September 30, 1994. Parcel 11 (approximately 986 acres) was transferred to Miami-Dade County on September 30, 2004. During the transfer proceedings, it was determined that sites within the area, now known as "Parcel 11E", would be subject to land use restrictions instituted at that time to protect the public and environment. Therefore, Parcel 11E was separated from the Parcel 11 land transfer until deed restrictions for Parcel 11E could be finalized. Once the restrictive covenants had been approved, Parcel 11E was transferred to Miami-Dade County on July 12, 2006. Environmental Use Restrictive Covenants (EURCs) included in the Parcel 11 and Parcel 11E deeds are included in **Table 1**.

2.2 PREVIOUS INVESTIGATIONS AND ACTIVITIES

The IRP at the Former Homestead AFB was initiated in 1983 with a Phase I Records Search to identify potential IRP sites and areas of concern at the base. On August 30, 1990, Homestead AFB was placed on the NPL, which brought it under the federal facility provisions of Section 120 of CERCLA. This action required the USAF enter an FFA with USEPA Region 4 and FDEP. The FFA was signed by all parties and became effective on March 1, 1991.

The realignment process at the installation has not adversely affected the progression of the IRP. IRP studies, investigations, remedial designs, and RAs have been performed at the Former Homestead AFB. Key regulatory dates/actions for IRP activities conducted at the former base are as follows:

In August 1983, Homestead AFB initiated a Phase I Records Search to identify IRP sites and areas of concern. The Phase I Records Search document, prepared by Engineering Science, Inc., identified 13 locations as having the potential for environmental contamination (Engineering Science, Inc., 1983).

In March 1986, a Phase II Confirmation/Quantification IRP report was prepared by Science Applications International Corporation to quantify the extent and degree of contamination at the 13 sites.

In September 1987, Geraghty & Miller, Inc. was retained by the United States Army Corps of Engineers (USACE) to conduct Phase IV IRP Remedial Investigations (RI) at OUs 1 through 9. The objectives of the RIs were to determine the horizontal and vertical extent of the constituents at each possible source of contamination and determine the risks to public health and the environment. RIs were conducted according to CERCLA guidelines for each possible source of contamination.

On January 5, 1990, permit 72438-HH-001 was issued to Homestead AFB under RCRA as amended by the Hazardous and Solid Waste Amendments of 1984. The permit listed 21 solid waste management units (SWMUs). Eight SWMUs required the performance of RCRA Facility Investigations (RFI). Each of the eight SWMUs requiring RFIs has been investigated under the IRP, pursuant to Executive Order 12580, and in accordance with RCRA guidelines.

In accordance with 42 USC § 9620 (d)(2) of the SARA of 1986, USEPA prepared a final Hazard Ranking System scoring package. As a result of the Hazard Ranking System score, the facility was proposed for inclusion on the NPL on July 14, 1989. On August 30, 1990, Homestead AFB was finalized on the NPL.

Upon final listing of Homestead AFB on the NPL, USEPA Region 4, the State of Florida, and the USAF entered into a FFA on May 25, 1990 with an effective date of March 1, 1991.

In January 1991, the base entered into a Consent Agreement with FDEP making it subject to the requirements of Chapter 62-770 Florida Administrative Code (FAC), governing discharges of petroleum products to the environment.

On August 24, 1992 Hurricane Andrew struck south Florida, destroying 97 percent of Homestead AFB capabilities. The Base was subsequently slated for realignment in 1993. This listing resulted in the IRP being subject to the requirements of the Community Environmental Response Facilitation Act, thereby accelerating the CERCLA cleanup process. The listing also resulted in the establishment of an on-site operating location of the Air Force Base Conversion Agency (AFBCA). AFBCA was responsible for the cleanup and transition of base property targeted for civilian use. The AFBCA maintained complete responsibility for the IRP until late 1995, when an USAF funding policy mandated that AFRC manage the sites within the cantonment area.

In 1993, Montgomery Watson was retained by USACE to perform data gap investigations on nine CERCLA sites within the cantonment area and on 10 Possible Sources of Contamination.

In April 1993, a second RFI was conducted to evaluate possible releases resulting from Hurricane Andrew. A total of 68 SWMUs were identified.

In 1994, upon the departure of Air Combat Command from Homestead AFB, the installation was transitioned to AFRC. Homestead ARB encompasses approximately one-third of the installation's former property holdings.

In 1994, through an AFBCA initiative, Woodward-Clyde Consultants was retained by USACE to conduct confirmation sampling at 38 of the SWMUs identified in the 1993 RCRA facility assessment.

In October 1996, administration of the IRP within the cantonment area was transferred from AFBCA to AFRC. In October 2012, administration was transferred from the Air Force Real Property Agency, formerly the AFBCA, to AFCEC.

Additional site activities are discussed under Site Chronology in **Sections 3** through **10**.

2.3 REGULATORY HISTORY

Sites SS026/OU-14, SS034/OU-20, SS035/OU-21, OT022/OU-26, OT024/OU-28, OT026/OU-29, SS040/OU-30, and SS042/OU-31 are regulated under CERCLA. For each of these sites, FDEP Commercial/Industrial SCTLs and USEPA Regional Screening Levels were used to determine soil contamination and soil Remedial Goals (RG). FDEP Commercial/Industrial SCTLs were used in this effort because use of the Former Homestead AFB property is industrial. FDEP Groundwater Cleanup Target Levels (GCTLs), which are risk-based drinking water standards, and Federal Maximum Contaminant Levels (MCLs), were used to identify groundwater contamination and groundwater RGs. FDEP GCTLs were derived based on the following factors: lifetime excess cancer risk of $1.0E^{-6}$ and a hazard quotient of 1 or less. FDEP SCTLs and GCTLs are promulgated under FAC Chapter 62-777. FDEP SCTLs and GCTLs were revised on April 17, 2005, with the previous cleanup target levels dated May 26, 1999.

2.4 SITE CHARACTERISTICS

2.4.1 Climate

The Former Homestead AFB is located within a subtropical maritime climate, characterized by long, warm, rainy summers and mild, dry winters. Temperatures in the region are warm but are moderated by the maritime influences of the Atlantic Ocean and Gulf of Mexico. The average high temperature for the Former Homestead AFB is 81.3 degrees Fahrenheit (°F), while the average low temperature is 68.2°F. The average annual temperature is 74°F, with approximately 37 days reaching temperatures above 90°F.

In general, only two seasons characterize the local weather: a summer wet season from May through October, when 70 percent of the annual rainfall occurs, and a winter dry season from November through April. The average rainfall is about 8 inches per month during the rainy season

and about 2 inches per month during the dry season, with a total average annual rainfall of 63.3 inches per year (Engineering Science, Inc., 1983; USAF, 1994).

2.4.2 Topography

The Former Homestead AFB is located along the flank of the Atlantic Coastal Ridge and the Southern Coastal Slope, which are subdivisions of the southern distal zone of the Atlantic Coastal Plain physiographic province. The Atlantic Coastal Ridge is a major geomorphologic feature roughly paralleling the Florida east coast from Palm Beach County to the southern part of Miami-Dade County. The Atlantic Coastal Ridge forms the highest ground in Miami-Dade County, bounded to the south by coastal marshes and mangrove swamps and to the west by agricultural lands and the Everglades. The surface topography at the former base is relatively flat, with elevations ranging from 2 to 10 feet (ft) above mean sea level.

2.4.3 Drainage

Natural drainage on the Former Homestead AFB is generally poor due to the relatively flat surface and the shallow depth to the water table, which is either equal to or just below the land surface. Storm water runoff is collected in an internal drainage system of canals, swales, ditches, and culverts, most of which eventually discharge into the Boundary Canal system. This system consists of the Boundary Canal, the Flightline Canal, several associated drainage canals/ditches, and the storm water reservoir. The Boundary Canal surrounds the Former Homestead AFB property. A levee that runs along the outer bank of the Boundary Canal prevents runoff originating outside the Base from entering the property, except for a small portion at the northernmost end of the Base at a point along southwest 288th Street (USAF, 1994).

2.4.4 Geology

Surface soils at the Former Homestead AFB are typically less than 6 inches thick and consist of a soft, crumbly mixture of sand, clay, and limestone (marl), weathered limestone bedrock, or imported fill. The uppermost lithological unit at the Former Homestead AFB contains 15 to 20 ft of oolitic and fossiliferous (bryozoans) limestone of the Pleistocene-aged Miami Oolite. Oolites are spherical particles of calcium carbonate that form in near-shore marine environments. The Miami Oolite consists of soft cream or tan limestone, interbedded with sandy limestone, and thin layers of hard limestone. The Miami Oolite is very soft, porous, and permeable due to dissolution by recharging water. Where exposed to air at the surface, the oolite becomes hardened (indurated).

The underlying Fort Thompson Formation, also of Pleistocene age, consists of alternating shallow marine, brackish marine, and freshwater limestone consisting of white and tan to gray calcareous sandstone and sandy limestone with some quartz sand. The Fort Thompson Formation is highly permeable and is approximately 50 ft thick in the vicinity of Homestead AFB. Both the Miami Oolite and the Fort Thompson Formation comprise the upper portion of the Biscayne Aquifer, which is the principal potable water supply for Miami-Dade County.

Beneath the Fort Thompson Formation lies the Tamiami Formation, which consists of sandy and fossiliferous limestone and sand containing shells, marl, and silt, and is estimated to be

approximately 70 ft thick beneath the Former Homestead AFB. The upper portion of the Tamiami Formation is a permeable limestone that is part of the Biscayne Aquifer. The less permeable sections of the formation are considered to form the base of the aquifer (United States Geological Survey [USGS], 1990). The Hawthorn Formation, consisting of green, silty carbonates (dolosilt) and quartz sand, underlies the Tamiami Formation.

2.4.5 Hydrogeology

There are two major aquifer systems beneath the Base: a surficial, unconfined aquifer and a lower, confined aquifer. The lower aquifer system is commonly known as the Floridan Aquifer System. The Floridan Aquifer is the primary source of drinking water in the southeastern U.S., excluding south Florida. Beneath the general area of the Former Homestead AFB, the lower aquifer is approximately 2,800 ft thick, and the top of the aquifer is 950 to 1,000 ft below mean sea level.

Groundwater within this system contains dissolved chemical constituents at concentrations above the federal and state drinking water standards. Dissolved solids concentrations in the Upper Floridan Aquifer, near the east and west coasts of Florida, are elevated due to the mixing of fresh groundwater with deeper salt water that migrates into the aquifer from the ocean (USGS, 1990). Hence, in view of its poor chemical quality and its depth, the Floridan Aquifer System is of limited usefulness as a local potable water source in the vicinity of the Former Homestead AFB (USGS, 1990).

Overlying the Floridan Aquifer is an intermediate confining unit, which consists of a sequence of green clay, silt, limestone, and fine sand. In general, the sediments of this unit are of low permeability and do not provide an adequate source of potable water.

Overlying the intermediate confining layer is the surficial aquifer, which is the primary source of potable water for Miami-Dade County and has been declared a sole source aquifer by USEPA, pursuant to Section 1425 of the Safe Drinking Water Act. This aquifer, known as the Biscayne Aquifer, is composed mainly of highly permeable, oolitic limestone, and sandstone. Beneath the base, the Biscayne Aquifer extends from just below ground surface (bgs) to 80 to 120 ft bgs. The Biscayne Aquifer is designated by FDEP as a Class G-II aquifer under Chapter 62-520, FAC. A Class G-II aquifer is classified for potable water use with a total dissolved solids content of less than 10,000 milligrams per liter (mg/L) and is not considered a sole source aquifer.

The general direction of groundwater flow within the Biscayne Aquifer is to the east-southeast toward Biscayne Bay and the Atlantic Ocean. The hydraulic gradient is very flat, with an average of 0.3 ft per mile, using average water table depths for September over the period from 1974 to 1982. As a result, local flow directions are strongly influenced by rainfall and the presence of the drainage canal along the Base boundary (boundary canal). The water table is generally within 0 to 5 ft of the ground surface but may occur at or near the land surface during the wet season.

Susceptibility of the Biscayne Aquifer to groundwater contamination is extremely high due to factors such as high transmissivity and permeability, shallow depth to water, and lack of confinement. Groundwater flows generally east-southeast at the Former Homestead AFB.

Saline groundwater occurs in an area paralleling the coast that transects the Base. The salt water front at the basal portion of the Biscayne Aquifer, defined by water containing 1,000 mg/L chloride, apparently moved landward in response to extended municipal pumping in the early 1970s. Historical data obtained from wells located at the inland edge of the zone of diffusion indicated that chloride concentrations increased from 200 mg/L at a depth of 80 ft bgs to greater than 4,000 mg/L at a depth of 95 ft bgs.

3.0 SITE SS026/OU-14

3.1 BACKGROUND

3.1.1 Physical Characteristics

Site SS026/OU-14, an IRP site, was formerly used as a drum storage area and consists of two separate areas, OU-14A and OU14-B (**Figure 2**). The areas of this site are within Parcel 11 and Parcel 11E. Prior to the 2019 RA, OU14-A and OU14-B corresponded with Excavations 1 and 2 completed in the 1999 Interim Remedial Action (IRA), as discussed below (OHM, 2000). Based on the 2019 RA, the area boundaries have been updated based on confirmatory soil sampling results which clarified previous data gaps, as discussed below (URS/FPM, 2020a). Area OU14-A encompasses approximately 4,725 square ft, or 0.11 acre, and is associated with arsenic impacted soil. Area OU-14B encompasses approximately 2,790 square ft, or 0.064 acre, and is associated with benzo(a)pyrene (B(a)P) impacted soil. The site is currently vacant land with no structures present. The ground surface is partially asphalt/concrete-covered and partially grass-covered (URS/FPM, 2020a).

In December 2012 and June 2019, T&ES Surveys of areas in and around the vicinity of Site SS026/OU-14 were conducted. No occurrences of protected flora or fauna were noted at Site SS026/OU-14 in either event (URS/FPM, 2020a).

3.1.2 Land and Resource Use

Fifty-five-gallon drums of paint and solvent-related wastes were stored on the west side of former Building 720 from the early 1980s through approximately 1985. Built in 1950, the former Building 720 was used as an aircraft painting facility. Records indicated that no significant spills occurred at the site while it was in service.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County (URS/FPM, 2013).

There is no surface water body present on this site. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. The groundwater beneath Site SS026/OU-14 is not used as a potable source and there are no plans to do so.

3.1.3 Site Chronology

A list of important Site SS026/OU-14 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1983	Phase I
1994	Site Investigation
1995	Additional Site Investigation Sampling and Preliminary Risk Evaluation
1999	Interim Remedial Action
2008 - 2018	Deed Restriction Site Inspections
2013	Site Investigation/Re-evaluation
2017	Focused Feasibility Study
June 2019	Final ROD Signed
June 2019 – August 2019	Remedial Action
August 2019 – April 2020	Post Remedial Action Groundwater Evaluation
2019 - 2020	LUC Site Inspections

3.1.4 History of Contamination

As previously stated, fifty-five-gallon drums of paint and solvent-related wastes were stored at the site from the early 1980s through approximately 1985. The initial investigation conducted for Site SS026/OU-14 was Phase I of the IRP, which was completed in August 1983 (Engineering Science, Inc., 1983). The IRP Phase I Report concluded that the site had a low potential for contaminant migration.

3.1.5 Initial Response and Basis for Action

A Site Investigation (SI) was conducted in 1993, followed by additional SI sampling and a preliminary risk evaluation in 1995 (AFCEC, 2019). The results of SI sampling and preliminary risk evaluation indicated that arsenic and polycyclic aromatic hydrocarbons (PAH) exceeded risk-based concentrations in soil at the site. Arsenic was detected in one groundwater sample (SS26-MW-0002) at a concentration of 20 micrograms per Liter (µg/L), which was below the FDEP GCTL at that time (50 µg/L in 1993). Therefore, the two groundwater monitoring wells were abandoned in 2002. The FDEP GCTL for arsenic has since been revised to 10 µg/L, as of April 17, 2005.

An IRA was implemented at the site in 1999, which consisted of soil removal and disposal of approximately 70 tons of contaminated soil from OU-14A/Excavation 1 and OU-14B/Excavation 2. Excavation 1 was 45 ft long by 15 ft wide and 4 ft deep. Approximately 60 tons of contaminated soils were removed and disposed of. Confirmatory soil sampling results showed that soil with concentrations exceeding the remediation goal of 10 milligrams per kilogram (mg/kg) for arsenic were still present (OHM, 2000). Additional excavation work was not conducted as the exceedances present in floor samples were at a depth greater than 4 ft bgs, below the direct-exposure pathway, and in one sidewall sample at the southeast edge of the excavation, bordered

by asphalt. Excavation 2 was 10 ft by 10 ft and 2 ft deep. Approximately 10 tons of contaminated soils were removed and disposed of. Confirmatory soil sampling results showed soil with concentrations exceeding the RG of 1.5 mg/kg for B(a)P (OHM,2000). The RGs for arsenic and B(a)P were not the FDEP Commercial/Industrial SCTLs. Because this excavation is bordered by asphalt and concrete on all sides, additional excavation work was not completed since the adjacent paved surfaces act as a cover to prevent rainwater from infiltrating to the soil and prevent direct exposure to remaining contaminated soil. Excavations 1 and 2 were backfilled with clean, imported crushed limestone rock material and topsoil (OHM, 2000).

3.1.6 2013 Site Investigation/Re-evaluation

In 2013, a SI/Re-evaluation was conducted for Site SS026/OU-14 to determine the extent and concentrations of the remaining contaminants of concern (COCs) in the soil. Soil samples were collected from 0-2 ft bgs and 2-4 ft bgs, or 3-4 ft bgs from a total of 57 soil borings. Soil analytical data reported arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg and B(a)P equivalents above the FDEP Residential SCTL of 0.1 mg/kg (URS/FPM, 2013).

3.1.7 Focused Feasibility Study

To identify, develop, screen, and evaluate a range of remedial alternatives that address contamination at Site SS026/OU-14, a streamlined Feasibility Study (FS), known as a Focused Feasibility Study (FFS), was conducted. As an FFS, only three alternatives were evaluated: no action, excavation with off-site disposal and LUCs, and contamination containment and LUCs (FPM, 2017).

3.2 SS026/OU-14 RECORD OF DECISION

A ROD was signed in June 2019 and is provided in **Appendix A**. The selected remedy included Excavation with off-site disposal, long-term groundwater monitoring if necessary, and LUCs (AFCEC, 2019). The Site SS026/OU-14 LUCs objectives are to:

- Prevent residential use, including use of the property for hospitals for human care, public or private school for persons under 18 years of age, or daycare centers for children.
- Prevent groundwater use at the site. This LUC will remain in place until it is determined that groundwater contaminant concentrations are below cleanup levels.[2]
- Prevent exposure to soil at the site. This LUC will remain in place until it is determined that soil contaminant concentrations allow for UU/UE.
- Maintain the integrity of any current or future remedial or monitoring system such as monitoring wells.

[2] Confirmation that groundwater contaminant concentrations were below cleanup levels was documented in the SS026/OU-14 Groundwater Evaluation Report (URS/FPM, 2021a).

3.2.1 Remedy Selection

The Remedial Action Objectives (RAO) for the Site SS026/OU-14 site is to prevent human exposure to soil and groundwater contamination exceeding the FDEP residential SCTL and GCTL for arsenic and FDEP residential SCTL and GCTL for B(a)P. The FDEP Residential SCTLs for arsenic and B(a)P are 2.1 mg/kg and 0.1 mg/kg, respectively. The FDEP GCTLs and the Federal MCLs for arsenic and B(a)P are 10 µg/L and 0.2 µg/L, respectively.

The remedy selected for Site SS026/OU-14, as identified in the ROD, is as follows:

Soil: Removing contaminated soils from OU-14A (arsenic) and OU-14B (B(a)P) above FDEP Commercial/Industrial SCTLs and achieve RAOs. Implementation of LUCs preventing the unacceptable exposures to residual contamination above FDEP residential SCTLs in soils.

Groundwater: Implement LUCs preventing the unacceptable exposures to residual contamination above Federal MCLs and FDEP GCTLs in groundwater and evaluate groundwater conditions at the site following soil removal. If arsenic and/or B(a)P is reported above Federal MCLs and FDEP GCTLs, the horizontal and vertical extent of the impacted groundwater will be delineated. In addition, long-term groundwater monitoring will be implemented as part of the ongoing biennial monitoring program for the Former Homestead AFB with reporting to the USEPA and FDEP. Long-term groundwater monitoring will not be implemented if arsenic and B(a)P concentrations are detected below Federal MCLs and FDEP GCTLs in the groundwater evaluation. In addition, the groundwater LUC will be removed once groundwater sampling determines that groundwater contaminant concentrations are below cleanup levels in two consecutive sampling events.

3.3 REMEDY IMPLEMENTATION

3.3.1 2019 Soil Removal

A total of approximately 1,154 tons of contaminated soil were removed to 4 ft bgs at OU-14A and to 3 ft bgs at OU-14B (**Figure 3**). Confirmatory soil samples were collected from the walls and bottom surface at each excavation area. The laboratory analytical results indicated that arsenic concentrations were below the FDEP Commercial/Industrial SCTL of 12 mg/kg at Area OU-14A and B(a)P concentrations were below the FDEP Commercial/Industrial SCTL of 0.7 mg/kg at Area OU-14B (URS/FPM, 2020a). Following the confirmatory soil sampling, each excavation was restored to original grade using clean fill comprised of lime rock obtained from a local quarry.

As a result of the RA, revisions to the OU-14A and OU-14B LUC boundaries were required based on confirmatory soil sample results and data gap confirmation. The possibility for potential LUC boundary revisions were presented in the 2019 Remedial Design (FPM, 2019). The LUC boundaries for OU-14A were revised to include the additional excavation to the north of the original boundaries where confirmatory soil sampling results indicated that arsenic was below the FDEP Commercial/Industrial SCTL of 12 mg/kg. The LUC site boundaries for OU-14B were revised to include two post RA confirmatory soil sample locations with B(a)P concentrations above and/or equal to the FDEP Residential SCTL of 0.1 mg/kg. Revisions to the LUC site

boundaries were documented in the Site SS026/OU-14 Remedial Action Report (URS/FPM, 2020a). **Figure 2** illustrates the LUC boundaries for each area.

3.3.2 Groundwater Evaluation

Two monitoring wells were sampled following site restoration per the requirements of the Remedial Design (FPM, 2019). Monitoring wells SS26-MW02R and SS26-MW03 were sampled on August 20, 2019, February 5, 2020, and April 6, 2020 (**Figure 3**). The analytical results from the first sampling event conducted on August 20, 2019, reported an arsenic concentration of 14.2 µg/L for monitoring well SS26-MW02R, which exceeded the FDEP GCTL and Federal MCL of 10 µg/L. The following two sampling events conducted on February 5, 2020, and April 6, 2020 detected arsenic concentrations of 6.9 J µg/L and 2.1 J µg/L, respectively which are below FDEP GCTL and Federal MCL of 10 µg/L. The J qualifier indicates an estimated value due to high duplicate relative percent difference. The analytical results at SS26-MW03 indicated B(a)P was not detected in any of the sampling events conducted. Based on groundwater sampling results, no additional sampling was recommended for the site (URS/FPM, 2021a). As a result, long-term groundwater monitoring and groundwater restrictions, as part of the selected remedy for the site, are no longer warranted. FDEP and USEPA approval of this recommendation was provided on December 7, 2020, and February 17, 2021, respectively.

3.3.3 Land Use Controls

Deed restrictions, implemented in the form of land use restrictions, were formally implemented as LUCs in the Site SS026/OU-14 ROD. In accordance with the 2019 Remedial Design, updated LUC boundaries, based on the 2019 soil removal limits, were documented in the Site SS026/OU-14 Remedial Action Report (URS/FPM, 2020a). In accordance with the Site SS026/OU-14 ROD, LUC inspections are conducted at the site annually with LUC compliance interviews with the owner of the property. The results from the post ROD inspection events are provided in the ***Progress Since the Last Review*** section.

3.4 PROGRESS SINCE THE LAST REVIEW

The ROD for Site SS026/OU-14 was signed in June 2019. Following ROD signature, soil removal and a groundwater evaluation were completed in 2019 and 2020 as presented in **Section 3.3**. In addition to these activities, visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2019 and 2020 in accordance with the Site SS026/OU-14 ROD. Site SS026/OU-14 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the inspections and interviews indicated that the site is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11 and Parcel 11E Deeds EURCs (**Table 1**), and that the property owner is aware of the LUC mandatory compliance.

3.5 FIVE-YEAR REVIEW PROCESS

3.5.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site SS026/OU-14. Relevant documents/data sources include, but are not limited to the 1994 Site Investigation Report, the 1997 Extended Site Investigation Report, the 2000 Interim Remedial Action Report, the Parcel 11 Deed, the Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the 2017 FFS, the Site SS026/OU-14 ROD (signed in June 2019), the 2019 Remedial Design, the 2020 Remedial Action Report, the 2020 Groundwater Evaluation Report, the 2019 LUC Site Inspection Report, and the 2020 Long-Term Management Report (2020 LUC site inspection).

3.5.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring required by the ROD. No unusual observations or breaches/failures of the remedy were documented during this visit. An interview with a representative of the property owner was also completed through email. The representative is aware of the LUC mandatory compliance. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

3.6 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, the ROD specifies prohibitions for excavation of soils and residential use restrictions. The arsenic remaining in soil does not allow for UU/UE. Based on the RA completed in 2019, soil with arsenic and B(a)P concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site. Site SS026/OU-14 is vacant/open space and the property is designated for industrial use. With the LUCs in place, there are no unacceptable risks to human health posed by soil contamination at Site SS026/OU-14 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11 and Parcel 11E Deeds provide sufficient LUC language.

Following the soil removal, a groundwater evaluation was completed at two monitoring wells. Samples were analyzed for arsenic and PAHs. Arsenic was detected below the Federal MCL and FDEP GCTL of 10 µg/L for two consecutive sampling rounds. In addition, the analytical results indicated B(a)P was not detected in any of the sampling events conducted. Per the exit strategy from the Remedial Design, no additional sampling was recommended for the site as contaminant concentrations were below the Federal MCL and FDEP GCTL for two consecutive sampling events (URS/FPM, 2021a). As a result, long-term groundwater monitoring and LUCs restricting groundwater use, as part of the selected remedy for Site SS026/OU-14, are no longer warranted. USEPA and FDEP approval of this recommendation was provided on February 21, 2021 and December 7, 2020, respectively.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Yes, the exposure assumptions, toxicity data, and RAOs used at the time of the remedy selection for groundwater and soil are still valid. The groundwater RG is the Federal MCL and FDEP GCTL of 10 µg/L for arsenic.

Yes, the soil RGs, as captured in the ROD follows the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP Residential SCTL for B(a)P is 0.1 mg/kg and the FDEP Commercial/Industrial SCTL for B(a)P is 0.7 mg/kg.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No new information has come to light that would question the protectiveness of the remedy.

3.7 ISSUES

Site SS026/OU-14 is within the boundaries of Parcel 11E. However, the LUC site boundaries were revised based on the 2019 RA and now extend into Parcel 11. As a result, Site SS026/OU-14 should be accounted for in future transfer documentation of Parcel 11. Parcel 11 currently has EURCs, as provided below, which are applicable to Site SS026/OU-14. No other issues were identified in this review for Site SS026/OU-14.

EURCs, applicable to Site SS026/OU-14, provided in the deed for Parcel 11 include:

- In order to prevent human exposure to arsenic in soils on the Property above 10 parts per billion, the Grantee shall not use the Property for permanent residential purposes, hospitals for human care, public or private schools for persons under 18 years of age, or day care centers for children. For the purposes of this prohibition permanent residential purposes shall mean market housing with permanent utility connections designed for non-temporary accommodation of individuals or families.

- The Grantee covenants not to disturb, move, damage, mar, tamper with, interfere with, obstruct, or impede any wells and treatment facilities and systems, and related piping used in the environmental remediation and restoration on the Property.

3.8 RECOMMENDATIONS

Based on the confirmed absence of groundwater contamination at the site, it is recommended that groundwater use restrictions, as part of the remedy, be removed. These LUCs were implemented through the 2019 Remedial Design (FPM, 2019). Arsenic and B(a)P concentrations in soil at the site are below FDEP Commercial/Industrial SCTLs of 12 mg/kg and 0.7 mg/kg, respectively. However, the Arsenic and B(a)P concentrations in soil at the site are above FDEP Residential

SCTLs of 2.1 mg/kg and 0.1 mg/kg, respectively. Therefore, continuation of annual LUC site inspections and FYRs are recommended.

It is also recommended that the revised Site SS026/OU-14 LUC site boundaries be accounted for during any future transfer of Parcel 11 property adjacent to the previously defined site boundary in the Parcel 11E deed.

3.9 PROTECTIVENESS STATEMENT

The remedy at Site SS026/OU-14 is protective of human health and the environment.

3.10 NEXT REVIEW

Site SS026/OU-14 will be subject to the next FYR. The next FYR is due January 12, 2026.

4.0 SITE SS034/OU-20

4.1 BACKGROUND

4.1.1 Physical Characteristics

Site SS034/OU-20 occupies an area of 14,000 square ft located near the intersection of St. Lo Boulevard and St. Nazaire Boulevard (**Figure 4**) in Parcel 11E. The area consists of a grassy section and a paved parking lot adjacent to Buildings 618 and 619. The parking lot is relatively flat and is bounded by grass on the northwest and northeast sides. Building 618 is on the southwest side of the parking lot, and Site SS035/OU-21 (which includes Building 619) is located on the southeast side of Site SS034/OU-20. A drainage ditch is located between the parking lot at Site SS034/OU-20 and St. Lo Boulevard to the north. Site SS034/OU-20 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County. Sites SS034/OU-20 and SS035/OU-21 encompass an area of approximately 83,473 square ft or 1.92 acres and are in an unpopulated area, with no residences located on the sites or nearby. Currently, only workers may access the sites periodically. There are no known environmentally sensitive areas on the site.

In December 2012, September 2017, and March 2018, T&ES Surveys of areas in and around the vicinity of Site SS034/OU-20 were conducted. No occurrences of protected flora or fauna were noted at Site SS034/OU-20 in any of the events (URS/FPM, 2019).

4.1.2 Land and Resource Use

According to historical records, Site SS034/OU-20 was used as a staging area for hazardous wastes collected following Hurricane Andrew. A contractor collected waste from various areas around the Base and stored waste containers in Building 619 (Site SS035/OU-21) and the adjacent parking lot adjacent to Site SS034/OU-20.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

There is no surface water body present on these sites. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. The groundwater beneath Site SS034/OU-20 is not used as a potable source and there are no plans to do so.

4.1.3 Site Chronology

A list of important Site SS034/OU-20 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1993	Visual Inspection
1994	Confirmation Sampling
1997-1998	RI/Baseline Risk Assessment (BRA)
1999	Feasibility Study (FS)
February – July 2001	IRA in Support of Proposed ROD
December 2001	IRAs in Support of Proposed ROD Report
April 2003	2003 Annual Groundwater Sampling
May 2003	First FYR
April 2004	2004 Annual Groundwater Sampling
April 2006	2006 Biennial Groundwater Monitoring
June 8, 2006	Final ROD Signed
April 2008	2008 Biennial Groundwater Monitoring
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
February 2010	2010 Biennial Groundwater Monitoring
2013	Site Investigation/Re-evaluation
March 2013	2012 Biennial Groundwater Monitoring
October 2014	2014 Biennial Groundwater Monitoring
January 2015 – September 2016	Third FYR
October 2016	2016 Biennial Groundwater Monitoring
April 2018 – June 2018	Additional Remedial Action
October 2018	2018 Biennial Groundwater Monitoring
June 2018 – April 2019	Post Additional Remedial Action Groundwater Sampling
March 2020 – September 2020	Groundwater Treatment Pilot Study
December 2020	2020 Biennial Groundwater Monitoring

4.1.4 History of Contamination

During the 1993 visual inspection, eight drums stored on pallets and labeled “tar and gravel” were observed in the southwest corner of the parking lot, and seven drums reportedly filled with grease from lift stations were located along the northeast edge of the pavement of Site SS034/OU-20. Some staining was also observed on the pavement.

4.1.5 Initial Response and Basis for Action

Preliminary investigations were completed at Site SS034/OU-20 as part of the confirmation sampling program. This sampling program indicated that arsenic exceeded risk-based concentrations in soil and groundwater. Based on these results, an expanded SI was conducted. This investigation concluded that since arsenic exceedances were observed in the soil and groundwater, the OU should progress to the RI phase.

Additionally, in 1994, an underground storage tank (UST) located near the northern end of the northwest side of Building 618 was excavated under the Base UST/OWS Remediation Program. No visual contamination was observed during the excavation activities. Subsequent sampling of a monitoring well installed in the previous excavation area revealed no COCs.

In 1996, an IRA was performed to remove relatively high concentrations of arsenic near the previous confirmation sampling program soil boring locations. Arsenic concentrations reported in sidewall and floor samples ranged from 2.1 to 21.2 mg/kg. A monitoring well was installed in the center of the excavation, and subsequent sampling of the groundwater revealed an arsenic concentration of 80 µg/L. Approximately 100 tons of contaminated soil were removed at Site SS034/OU-20.

A RI/BRA was completed for the site in 1998. Additional soil borings and monitoring wells were installed at the sites. Sampling and analysis indicated that arsenic was still a COC in the soils and groundwater at the sites. Arsenic was also found in sediments in the canal segment adjacent to Site SS035/OU-21. As a result of this information, it was determined that arsenic found at the sites posed a potential unacceptable risk to human health (MWH, 2006).

4.2 SS034/OU-20 RECORD OF DECISION

A ROD was signed by USEPA for Site SS034/OU-20 on June 8, 2006 and is provided in **Appendix A**. The selected remedy included soil removal, groundwater monitoring, and LUCs (MWH, 2006). The Site SS034/OU-20 LUCs objectives are to:

- Prevent human exposure to soil contaminated with arsenic above the FDEP Residential SCTLs.
- Prevent direct human exposure to groundwater contaminated with arsenic above the Federal MCL and FDEP GCTL of 10 µg/L.
- Protect the integrity of the groundwater monitoring wells until such time as groundwater monitoring, as a means of compliance with LUCs are satisfied or monitoring during the FYR is no longer required.

4.2.1 Remedy Selection

RAOs were proposed for Site SS034/OU-20 for use during the development of remedial alternatives. These RAOs stress protection of human health and the environment and are detailed in the Site SS034/OU-20 ROD. The RAOs that were developed are as follows:

- Prevent human exposure to soils that contain arsenic at concentrations above the RG of 10 mg/kg.

- Prevent human exposure to groundwater that contains arsenic at concentrations above the Federal MCL and FDEP GCTL of 10 µg/L.

The remedies selected for this site as identified in the ROD are as follows.

Soil: Removal of soils containing arsenic at levels above the alternate industrial SCTL/RG of 10 mg/kg for disposal in a solid waste (RCRA Subtitle D) landfill and implementation of LUCs associated with residual soil contamination.

Groundwater: Long-term groundwater monitoring of the arsenic concentrations to document and quantify the concentrations of arsenic and associated risk to human health and the environment and implementation of LUCs.

4.3 REMEDY IMPLEMENTATION

4.3.1 2001 Soil Removal

Beginning February 2001, an IRA was conducted in anticipation of the Site SS034/OU-20 ROD, even though the ROD had not been signed at that time. Approximately 4,700 tons of contaminated soil/limestone and 22 tons of sediment from the canal bordering Site SS034/OU-20 and a portion of Site SS035/OU-21 were removed and disposed of during implementation of the IRA (IT Corporation, 2002).

Results of the IRA at Site SS034/OU-20 indicated exceedances of arsenic were present in excavation sidewall and floor samples. Soil boring analytical results indicated elevated levels of arsenic confined to the 1.0 to 1.5 ft bgs interval. Based on these results, the depth for the excavation was extended an additional 0.5 ft (1.0 ft total depth) for the entire site. Additionally, excavation at two "hot spot" areas was extended an additional 1.0 ft (2.0 ft total depth). A statistical evaluation showed the 95th upper confidence limit of the mean arsenic concentration decreased 95 percent (from 105 to 5.8 mg/kg) as a result of the removal action (IT Corporation, 2002). The 5.8 mg/kg mean arsenic concentration was below the previously-approved-background value of 10 mg/kg and FDEP Commercial/Industrial SCTL of 12 mg/kg. Upon completion of the IRA, one sample location exhibited an arsenic concentration of 10.3 mg/kg, slightly above the previously approved background value of 10 mg/kg. This area was not removed as it abutted the asphalt parking lot, which serves as a cap.

4.3.2 Groundwater Monitoring

Following completion of the IRA at Site SS034/OU-20, the USAF initiated semiannual long-term groundwater monitoring in October 2001. In 2004, the sampling frequency was revised to biennial and has been completed through 2020. As groundwater monitoring is ongoing and the latest event was completed in December 2020, the results from the most recent monitoring event and historical data comparison are provided in the ***Progress Since the Last Review*** section to provide chronological descriptions of tasks completed since the last FYR.

4.3.3 Land Use Controls

Deed restrictions, implemented in the form of land use restrictions, were formally implemented as LUCs in the Site SS034/OU-20 ROD. Per the requirements from USEPA in their 3 July 2008 letter (**Appendix A**), annual LUC inspections have also been performed at the site since 2008 to ensure that the LUCs continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

4.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site SS034/OU-20 to determine the extent of the remaining arsenic concentrations in the soil and groundwater at the site. The SI/Re-evaluation included soil sampling at 66 boring locations and groundwater sampling at five monitoring wells for arsenic analysis. Arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg were detected in three soil sampling locations from 2 ft bgs to 4 ft bgs. In addition, groundwater sampling results indicated arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L in samples from monitoring wells OU20-B618-MW01 and OU20-MW04, at 48 µg/L and 17.8 µg/L, respectively. In addition, OU20-MW04 was replaced by OU20-MW04R as a result of the 2018 Additional RA. Details for the 2013 SI/Re-evaluation can be found in the Final Site Investigation Report, dated September 2013 (URS/FPM, 2013).

4.5 PROGRESS SINCE THE LAST REVIEW

The Third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the Third FYR, "the selected remedy at Site SS034/OU-20 is protective of human health and the environment in the short term and will be protective in the long-term once the areas of additional arsenic contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing an Additional RA. Based on the ongoing long-term groundwater monitoring, and LUCs in place, both in the ROD and the property transfer deed, objectives of the recorded remedy are being achieved in the short-term and exposure pathways that could result in unacceptable risks are being controlled". As a result, the Third FYR recommended that an Additional RA for removing soils above the FDEP Commercial/Industrial SCTLs for industrial land use be conducted for long-term protectiveness of the remedy selected in the ROD. The Additional RA was completed in 2018 per this recommendation and is discussed below. This section also includes the descriptions and results of

additional activities completed since the Third FYR, including the post soil removal groundwater monitoring, groundwater treatment pilot study, and the ongoing long-term groundwater monitoring, which is conducted in accordance with the ROD.

4.5.1 Additional Remedial Action – Soil

An Additional RA was initiated in April 2018, which entailed excavating the impacted soil at Site SS034/OU-20 containing arsenic concentrations greater than the FDEP Commercial/Industrial SCTL of 12 mg/kg that were identified in the 2013 SI/Re-evaluation. Following the removal of approximately 645 tons of arsenic contaminated soil to 4 ft bgs, confirmatory soil sampling was conducted. The excavation location is illustrated in **Figure 5**. Based on the confirmatory soil sampling results, the soil that was previously found to contain arsenic concentrations exceeding the FDEP Commercial/Industrial SCTL of 12 mg/kg was removed to 4 ft bgs, approximately 6-inches above the groundwater table. The excavation was then restored with clean backfill material (URS/FPM, 2019).

4.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil in June 2018, October 2018, January 2019, and April 2019. Monitoring wells OU20-B618-MW01R, OU20-MW02R, and OU20-MW04R were sampled in June and October 2018, monitoring wells OU20-MW03 and OU20-MW05 were sampled in October 2018 and monitoring well OU20-MW06 was sampled in June 2018, October 2018, January 2019, and April 2019. The monitoring well locations are illustrated in **Figure 5**. All samples were analyzed for arsenic by SW-846 Method 6010C and results are included in **Table 2**. Results indicated that arsenic concentrations in the groundwater exceeded the Federal MCL and FDEP GCTL in samples from OU20-B618-MW01R with concentrations of 18.6 µg/L in June 2018 and 29.5 µg/L in October 2018 (FPM, 2020). Arsenic concentrations were below the Federal MCL and FDEP GCTL in samples collected from the remaining monitoring wells (FPM, 2020).

4.5.3 Groundwater Treatment Pilot Study

A groundwater treatment pilot study was completed to evaluate the groundwater treatment approach and to determine the effectiveness in remediating arsenic impacted groundwater at Site SS034/OU-20. This pilot study included the application of Metafix® reagent by soil mixing in the saturated zone to create a permeable treatment area to remove dissolved arsenic from the groundwater by reductive precipitation and adsorption.

Baseline groundwater sampling was completed at OU20-B618-MW01R in March 2020 and July 2020 prior to the pilot study soil mixing activities. During the March event, the sample was analyzed for arsenic, calcium, cobalt, manganese, magnesium, and iron by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. The July 2020 sampling event was completed as part of baseline sampling to obtain results for antimony, cadmium, lead, nickel, and thallium by SW-846 Method 6010C and fluoride by SW-846 Method 9056 as well. Groundwater laboratory analytical data indicated that arsenic exceeded the Federal MCL and

FDEP GCTL of 10 µg/L in the sample collected from OU20-B618-MW01R (77 µg/L). All other detected analyte concentrations were below their respective Federal MCLs and FDEP GCTLs.

Approximately 6,000 pounds (lbs) of Metafix® reagent was applied to the excavation in the saturated zone and mixed within soils utilizing heavy equipment. The soil mixing occurred on July 23, 2020 (FPM, 2021a). Details of the soil mixing activities are included in the Groundwater Treatment Pilot Study Report (FPM, 2021a). The groundwater treatment excavation location is illustrated in **Figure 5**.

A post-remediation sampling event was completed on September 9, 2020 to determine the effectiveness of the pilot study in accordance with the Groundwater Treatment Pilot Study Work Plan (FPM, 2020). A sample collected at monitoring well OU20-B618-MW01R was analyzed for arsenic, antimony, cadmium, calcium, cobalt, iron, lead, manganese, magnesium, nickel, and thallium by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride, fluoride, and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. Arsenic was detected in September 2020 at OU20-B618-MW01R above the Federal MCL and FDEP GCTL of 10 µg/L at 50.9 µg/L. This concentration is a decrease from the March 2020 baseline event when arsenic was 77 µg/L indicating a slight decrease in concentrations following the soil mixing activities (FPM, 2022a).

4.5.4 Long-Term Groundwater Monitoring

In accordance with the 2006 ROD, groundwater monitoring has been completed at Site SS034/OU-20 since 2001 and has been completed biennially since 2004. Groundwater samples have been collected from three groundwater monitoring wells located within the site which include OU20-B618-MW01, OU20-MW02, and OU20-MW03. OU20-MW04R was recently added to the groundwater monitoring network for the 2020 biennial event given its location adjacent to the arsenic plume (FPM, 2022b). In addition, OU20-B618-MW01 and OU20-MW02 were replaced by OU20-B618-MW01R and OU20-MW02R, respectively, as a result of the 2018 Additional RA. Monitoring wells OU20-MW05 and OU20-MW06 also exist at the site but are not sampled as part of the Site SS034/OU-20 groundwater monitoring network. OU20-MW05 was installed as part of the 2013 SI/Re-evaluation and OU20-MW06 was installed following the 2018 Additional RA. Monitoring wells at Site SS034/OU-20 are illustrated in **Figure 5**.

The most recent biennial groundwater sampling event was conducted in December 2020. The groundwater elevations measured ranged between 1.29 and 1.97 ft National Geodetic Vertical Datum (NGVD) 29. All samples collected from the four monitoring wells were analyzed for total arsenic using SW-846 Method 6010D. Groundwater samples collected at OU20-B618-MW01/OU20-B618-MW01R have exhibited arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L during every sample event since 2001. The detected arsenic concentration at OU20-B618-MW01R was 40.2 µg/L in December 2020 (FPM, 2022b). The highest arsenic concentration (116 µg/L) was detected in OU20-B618-MW01 during the 2008 sampling event but has been exhibiting a decreasing trend since 2008. Arsenic concentrations in monitoring wells OU20-MW02R, OU20-MW03, and OU20-MW04R were below the Federal MCL and FDEP GCTL of 10 µg/L. Arsenic concentrations have not been detected above the Federal MCL and FDEP GCTL of 10 µg/L at OU20-MW02/OU20-MW02R and OU20-MW03 since the 2008

monitoring event. The analytical results indicate the arsenic exceedances are localized at OU20-B618-MW01R, with concentrations below the Federal MCL and FDEP GCTL at the remaining monitoring wells at the site. OU20-B618-MW01R lies near the center of the Site SS034/OU-20 boundaries. Therefore, any contaminant migration is unlikely to impact surrounding properties. Historical arsenic concentrations in the groundwater are provided in **Table 2**. The December 2020 arsenic concentrations and plume are illustrated in **Figure 5**.

4.5.5 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site SS034/OU-20 ROD. Site SS034/OU-20 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the annual inspections and interviews indicated that the site is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11E Deed EURCs (**Table 1**), and that the property owner is aware of the LUC mandatory compliance.

4.6 FIVE-YEAR REVIEW PROCESS

4.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site SS034/OU-20. Relevant documents/data sources include, but are not limited to the Visual Inspection, the Confirmation Sampling Report, the 1997 RI/BRA, the 2001 IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year Review, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the Annual and Biennial Groundwater Monitoring Reports (2001 Annual Groundwater Monitoring Report through the 2018 Biennial Groundwater Monitoring Report), the 2006 Final ROD for SS034/OU-20, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2019 Additional Remedial Action Completion Report – Soil, the 2020 Groundwater Treatment Pilot Study Work Plan, the 2020 Groundwater Treatment Pilot Study Report, the 2021 Optimization Recommendations Report, and the 2020 Annual Long-Term Management Report (2020 LUC site inspections and biennial) dated 2021.

4.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ROD. No unusual observations or breaches/failures of the remedy were documented during this visit. An interview with a representative of the property owner~~/occupants~~ was also completed through email. The representative is aware of the LUC mandatory compliance. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

4.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, ~~T~~the remedy for Site SS034/OU-20 is functioning as intended. The ROD specifies prohibitions for excavation of soils and residential use restrictions. The remedy also includes monitoring for groundwater with restrictions for groundwater use. The arsenic remaining in soil and groundwater does not allow for UU/UE. Based on the Additional RA completed in 2018, soil with arsenic concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site to within 6-inches of the groundwater table (approximately 4 ft bgs). Site SS034/OU-20 is vacant/open space and the property is designated for industrial use. With the LUCs in place, there are no unacceptable risks to human health posed by soil contamination at Site SS034/OU-20 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L are isolated to one monitoring well (OU20-B618-MW01/OU20-B618-MW01R) with an observed decreasing trend since 2008. Further reduction in arsenic concentrations were also observed at this monitoring well because of the groundwater treatment pilot study completed at the site in July 2020. Continued long-term groundwater monitoring will monitor arsenic plume trends in accordance with the remedy selected in the ROD. The continued long-term groundwater monitoring will also monitor the effectiveness of the 2020 groundwater treatment pilot study.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Yes, the exposure assumptions, toxicity data, and RAOs used at the time of the remedy selection for groundwater are still valid. The groundwater RG is the Federal MCL and FDEP GCTL of 10 µg/L for arsenic.

No, the soil RG of 10 mg/kg for arsenic, captured in the 2006 ROD, has since been rejected by the USEPA for the lack of supporting documentation regarding how this value was derived. As a result, soil RGs are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No, the Additional RA completed in 2018 removed previously identified soil with arsenic concentrations above the FDEP Commercial/Industrial SCTLs to within 6 inches of the groundwater table at Site SS034/OU-20 (approximately 4 ft bgs).

4.8 ISSUES

No issues were identified in this review for Site SS034/OU-20.

4.9 RECOMMENDATIONS

Arsenic concentrations in soil at Site SS034/OU-20 are above FDEP Residential SCTLs of 2.1 mg/kg. Therefore, continuation of annual LUC site inspections and FYRs are recommended. In addition, arsenic concentrations in groundwater at the site are also above the Federal MCL and FDEP GCTL of 10 µg/L; therefore, continuation of biennial groundwater monitoring is also recommended.

4.10 PROTECTIVENESS STATEMENT

The remedy at Site SS034/OU-20 is protective of human health and the environment.

4.11 NEXT REVIEW

Site SS034/OU-20 will be subject to the next FYR. The next FYR is due January 12, 2026.

5.0 SITE SS035/OU-21

5.1 BACKGROUND

5.1.1 Physical Characteristics

Site SS035/OU-21 is located west of the Flight Line Road and St. Nazaire Boulevard intersection (**Figure 6**) in Parcel 11E. Building 619 lies within the site boundaries and Building 618 lies outside the site boundaries adjacent to the west and is a one-story cinder block warehouse that was reportedly used to store flammables, acids, and hazardous waste. Grassy areas border the building with a paved parking lot located northwest of the building. A large drainage canal, 12 ft across and 5 ft deep, is located southeast of Building 619. Site SS035/OU-21 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County. Site SS035/OU-21 encompasses an area of approximately 1.87 acres. The site is in an unpopulated area, with no residences located on the site or nearby. Currently, only workers may access the sites periodically.

In December 2012, September 2017, and March 2018, T&ES Surveys of areas in and around the vicinity of Site SS035/OU-21 were conducted. During the 2012 and 2017 surveys, occurrences of Small's milkpea (*Galactia smallii*) were observed at the site. This is a federally protected plant. During the 2018 survey, no new occurrences of Small's milkpea were observed; however, an additional protected plant, Sand Flax (*Linum Arenicola*) was observed at the site. This is also a federally protected plant. No other protected flora or fauna species were noted at Site SS035/OU-21 in any of the events (URS/FPM, 2020b). The locations of the protected flora are illustrated in **Figure 6**.

5.1.2 Land and Resource Use

Building 618 was reportedly used to store flammables and acids prior to Hurricane Andrew and hazardous waste after the hurricane. Miami-Dade County currently uses the building for storage.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

The only surface water body present on this site is a large drainage canal, 12 ft across and 5 ft deep, located southeast of Building 618. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. The groundwater beneath Site SS035/OU-21 is not used as a potable source and there are no plans to do so.

5.1.3 Site Chronology

A list of important Site SS035/OU-21 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1993	Visual Inspection
1994	Confirmation Sampling
1997-1998	RI/BRA
1999	FS
February – July 2001	IRA in Support of Proposed ROD
December 2001	IRAs in Support of Proposed ROD Report
April 2003	2003 Annual Groundwater Sampling
May 2003	First FYR
April 2004	2004 Annual Groundwater Sampling
April 2006	2006 Biennial Groundwater Monitoring
June 8, 2006	Final ROD Signed
April 2008	2008 Biennial Groundwater Monitoring
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
February 2010	2010 Biennial Groundwater Monitoring
2013	Site Investigation/Re-evaluation
March 2013	2012 Biennial Groundwater Monitoring
October 2014	2014 Biennial Groundwater Monitoring
January 2015 – September 2016	Third FYR
October 2016	2016 Biennial Groundwater Monitoring
April 2018 – October 2018	Additional Remedial Action
October 2018	2018 Biennial Groundwater Monitoring
June 2018 – April 2019	Post Additional Remedial Action Groundwater Sampling
March 2020 – September 2020	Groundwater Treatment Pilot Study
December 2020	2020 Biennial Groundwater Monitoring

5.1.4 History of Contamination

Acids and flammables were once stored in Building 618. In 1994, during confirmation sampling, the building was being used by a contractor to stage hazardous waste from around the Base. Various

cleaners, a container labeled mercury switches, and two bays marked "acid storage" were observed. In addition, staining and areas of stressed vegetation were observed south of the building. Shallow surface soils were reportedly removed from the south sides of Buildings 618 and 619 after Hurricane Andrew.

5.1.5 Initial Response and Basis for Action

Preliminary investigations were completed at Site SS035/OU-21 as part of the confirmation sampling program. This sampling program indicated that arsenic exceeded risk-based concentrations in soil and groundwater. Based on these results, an expanded SI was conducted. This investigation concluded that since arsenic exceedances were observed in the soil and groundwater, the OU should progress to the RI phase.

In 1996, an IRA was performed to remove relatively high concentrations of arsenic near the previous confirmation sampling program soil boring locations. Arsenic concentrations reported in sidewall and floor samples ranged from 1.0 to 11.7 mg/kg. Approximately 140 tons of soil were removed at Site SS035/OU-21.

An RI/BRA was completed for the site in 1998. Additional soil borings and monitoring wells were installed at the sites. Sampling and analysis indicated that arsenic was still a COC in the soils and groundwater at the site. Arsenic was also found in sediments in the canal segment adjacent to Site SS035/OU-21. As a result of this information, it was determined that arsenic found at the site posed a potential unacceptable risk to human health (MWH, 2006).

5.2 SS035/OU-21 RECORD OF DECISION

A ROD was signed by USEPA for Site SS035/OU-21 on June 8, 2006 and is provided in **Appendix A**. The selected remedy included soil removal, groundwater monitoring, and LUCs (MWH, 2006). The Site SS035/OU-21 LUCs objectives are to:

- Prevent human exposure to soil contaminated with arsenic above the FDEP Residential SCTL.
- Prevent direct human exposure to groundwater contaminated with arsenic above the Federal MCL and FDEP GCTL of 10 µg/L.
- Protect the integrity of the groundwater monitoring wells until such time as groundwater monitoring, as a means of compliance with LUCs is satisfied or monitoring during the FYR is no longer required.

5.2.1 Remedy Selection

RAOs were proposed for Site SS035/OU-21 for use during the development of remedial alternatives. These RAOs stress protection of human health and the environment and are detailed in the Site SS035/OU-21 ROD, signed on June 8, 2006. The RAOs that were developed are as follows:

- Prevent human exposure to soils that contain arsenic at concentrations above the RG of 10 mg/kg.

- Prevent human exposure to groundwater that contains arsenic at concentrations above the Federal MCL and FDEP GCTL of 10 µg/L.

The remedies selected for this site as identified in the ROD are as follows.

Soil: Removal of soils containing arsenic at levels above the alternate industrial SCTL/RG (10 mg/kg) for disposal in a solid waste (RCRA Subtitle D) landfill and implementation of LUCs associated with residual soil contamination.

Groundwater: Long-term groundwater monitoring of the arsenic concentrations to document and quantify the concentrations of arsenic and associated risk to human health and the environment and implementation of LUCs.

5.3 REMEDY IMPLEMENTATION

5.3.1 2001 Soil Removal

Beginning February 2001, an IRA was conducted at Site SS035/OU-21 in parallel with the IRA at Site SS034/OU-20. Approximately 4,700 tons of contaminated soil/limestone and 22 tons of sediment from the canal bordering Site SS034/OU-20 and a portion of SS035/OU-21 were removed and disposed of during implementation of the IRA (IT Corporation, 2002).

Results of the IRA at Site SS035/OU-21 indicated exceedances of arsenic were present in excavation sidewall and floor samples. Soil boring analytical results indicated elevated levels of arsenic confined to the 1.0 to 1.5 ft bgs interval. Based on these results, the depth for the excavation was extended an additional 0.5 ft (1.0 ft total depth) for the entire site. Additionally, excavation at two "hot spot" areas was extended an additional 1.0 ft (2.0 ft bgs). A statistical evaluation showed the 95th upper confidence limit of the mean arsenic concentration decreased 95 percent (from 105 to 5.8 mg/kg) because of the removal action. The 5.8 mg/kg mean arsenic concentration was below the remediation goal of 10 mg/kg and the FDEP Commercial/Industrial SCTL of 12 mg/kg. Upon completion of the IRA, five locations exhibiting arsenic exceedances in the excavation (maximum of 107 mg/kg) were not removed due to the presence of asphalt parking areas, a canal edge, or footers for Building 618.

5.3.2 Groundwater Monitoring

Following completion of the IRA at Site SS035/OU-21, the USAF initiated semiannual long-term groundwater monitoring in October 2001. In 2004, the sampling frequency was revised to biennial and has been completed through 2020. As groundwater monitoring is ongoing and the latest event was completed in December 2020, the results from the most recent monitoring event and historical data comparison are provided in the ***Progress Since the Last Review*** section to provide chronological descriptions of tasks completed since the last FYR.

5.3.3 Land Use Controls

Deed restrictions, implemented in the form of land use restrictions, were formally implemented as LUCs in the Site SS035/OU-21 ROD. Per the requirements from USEPA in their 3 July 2008 letter (**Appendix A**), annual LUC inspections have also been performed at the site since 2008 to ensure that the LUCs continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

5.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site SS035/OU-21 to determine the extent of the remaining arsenic concentrations in the soil and groundwater at the site. The SI/Re-evaluation included soil sampling at 53 soil boring locations and groundwater sampling at 22 monitoring wells for arsenic. Arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg were detected in four soil sampling locations from 0 to 4 ft bgs. In addition, groundwater sampling results indicated arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L were present in the samples collected from monitoring wells OU21-MW01, OU21-MW02, OU21-MW05, OU21-MW06, and OU21-MW08. Arsenic exceedances ranged from 133 µg/L to 699 µg/L. Details of the 2013 SI/Re-evaluation can be found in the *Final Site Investigation Report*, dated September 2013 (URS/FPM, 2013).

5.5 PROGRESS SINCE THE LAST REVIEW

The Third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the Third FYR, "the selected remedy at Site SS035/OU-21 is protective of human health and the environment in the short term and will be protective in the long-term once the areas of additional arsenic contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing an Additional RA. Based on the ongoing long-term groundwater monitoring, and LUCs in place, both in the ROD and the property transfer deed, objectives of the remedy in the ROD are being achieved in the short-term and exposure pathways that could result in unacceptable risks are being controlled". As a result, the Third FYR recommended that an Additional RA for removing soils above the FDEP Commercial/Industrial SCTLs for industrial land use be conducted for long-term protectiveness of the remedy selected in the ROD. The Additional RA was completed in 2018 per this recommendation and is discussed below. This section also includes the descriptions and results of additional activities completed since the Third FYR, including the post soil removal groundwater monitoring, groundwater treatment pilot study, and the ongoing long-term groundwater monitoring, which is conducted in accordance with the ROD.

5.5.1 Additional Remedial Action - Soil

In April 2018, an Additional RA involving soil excavation was initiated at the five areas to address the impacted soil in SS035/OU-21 with arsenic concentrations above the FDEP

Commercial/Industrial SCTL of 12 mg/kg, originally identified during 2013 SI/Re-evaluation. The locations of the five excavation locations are illustrated in **Figure 7**. These areas were identified as Excavation Areas 1, 2, 3, S2, and S21 and the excavation depths ranged from 2 ft bgs to 4 ft bgs (URS/FPM, 2020b). Following the removal of approximately 664 tons of arsenic contaminated soil, confirmatory soil sampling was conducted. Confirmatory soil sampling results indicated that arsenic concentrations were below the targeted RGs at three areas but above the FDEP Commercial/Industrial SCTL for arsenic of 12 mg/kg at the remaining two areas (Excavation Areas 1 and S2). Over-excavation was not conducted at the remaining areas due to field constraints, such as the presence of T&ES (Small's milkpea [*Galactia smallii*] and Sand flax [*Linum arenicola*]), an active roadway, and Building 618, or the sampling locations vicinity to groundwater (URS/FPM, 2020b). The field constraint boundaries are illustrated in **Figure 6**.

5.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil. Monitoring wells OU21-MW01, OU21-MW02, OU21-MW03R, OU21-MW05, OU21-MW06, OU21-MW07, and OU21-MW08 were sampled in June and October 2018. In addition, quarterly post excavation groundwater sampling activities at OU21-MW17 were performed in June 2018, October 2018, January 2019, and April 2019. Monitoring well OU21-MW04 was also sampled in December 2018, after the well was cleared of roots, which prevented sampling during the previous monitoring events. The monitoring wells are illustrated in **Figure 7**. All samples were analyzed for arsenic by SW-846 Method 6010C and results are included in **Table 3**. Results indicated arsenic concentrations exceeded the Federal MCL and FDEP GCTL in samples from six of the nine sampled monitoring wells (OU21-MW01, OU21-MW02, OU21-MW03R, OU21-MW05, OU21-MW06, and OU21-MW08). The arsenic concentrations in groundwater from these six monitoring wells ranged from 10.4 µg/L to 939 µg/L during the June 2018 event and from 15.6 µg/L to 881 µg/L during the October 2018 event (FPM, 2020). The maximum detected arsenic concentrations were detected in the samples from monitoring well OU21-MW06. Arsenic concentrations at the remaining monitoring wells were below the Federal MCL and FDEP GCTL in all of the sampling events (FPM, 2020).

5.5.3 Groundwater Treatment Pilot Study

A groundwater treatment pilot study was completed to evaluate the groundwater treatment approach and to determine the effectiveness in remediating arsenic impacted groundwater at Site SS035/OU-21. This pilot study included the application of Metafix® reagent by soil mixing in the saturated zone to create a permeable treatment area to remove dissolved arsenic from the groundwater by reductive precipitation and adsorption.

Baseline groundwater sampling was completed in March 2020 and July 2020 at monitoring wells OU21-MW01, OU21-MW02, OU21-MW03R, OU21-MW06, and OU21-MW08 prior to the pilot study soil mixing activities. During the March event, the samples were analyzed for arsenic, calcium, cobalt, manganese, magnesium, and iron by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. The July 2020 sampling event was completed as part of baseline sampling to obtain results for antimony, cadmium, lead, nickel, and thallium by SW-

846 Method 6010C and fluoride by SW-846 Method 9056 as well. Groundwater laboratory analytical data indicated that arsenic exceeded the Federal MCL and FDEP GCTL of 10 µg/L in samples collected from all five monitoring wells. The highest concentration of arsenic was observed at OU21-MW06 (1,000 µg/L). Additionally, iron exceeded the Federal MCL and FDEP GCTL of 300 µg/L at OU21-MW08 (670 µg/L). All other detected analyte concentrations were below their respective Federal MCLs and FDEP GCTLs.

Approximately 7,400 lbs of Metafix® reagent was evenly applied to two excavations within the saturated zone and mixed within soils utilizing heavy equipment. The soil mixing occurred on July 21 and 23, 2020. Details of the soil mixing activities are included in the Groundwater Treatment Pilot Study Report (FPM, 2021a). The groundwater treatment excavation is illustrated in **Figure 7**.

A post-remediation sampling event was completed between September 8 and 10, 2020 to determine the effectiveness of the pilot study in accordance with the Groundwater Treatment Pilot Study Work Plan (FPM, 2020). Samples collected from monitoring wells OU21-MW01, OU21-MW02, OU21-MW03R, OU21-MW06, and OU21-MW08 were analyzed for arsenic, antimony, cadmium, calcium, cobalt, iron, lead, manganese, magnesium, nickel, and thallium by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride, fluoride, and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. Arsenic exceedances of the Federal MCL and FDEP GCTL of 10 µg/L were limited to monitoring wells OU21-MW01, OU21-MW02, OU21-MW03R, and OU21-MW06 with concentrations of 97.8 µg/L, 88.5 µg/L, 153 µg/L, and 692 µg/L, respectively (FPM, 2022a). September 2020 arsenic concentrations at OU21-MW01, OU21-MW02, and OU21-MW06 were lower than for the March 2020 event, which were 172 µg/L, 339 µg/L, and 1,000 µg/L, respectively. The September 2020 arsenic concentration at OU21-MW03R was higher than for the March 2020 event, which was 115 µg/L. However, this well is upgradient of the groundwater treatment excavations, which indicates random and/or seasonal variability. All other analytes were detected below the Federal MCLs and FDEP GCTLs except for iron at one monitoring well. The iron concentration at OU21-MW08 was 1,670 µg/L. The Federal MCL and FDEP GCTL for iron is 300 µg/L.

5.5.4 Groundwater Vertical Migration Evaluation

A groundwater vertical migration evaluation was completed in September 2020 because of regulatory comments received for the 2020 Groundwater Treatment Pilot Study Work Plan (FPM, 2020). This evaluation included the installation of deep monitoring well OU21-MW06D and the subsequent sampling of monitoring wells OU21-MW06 and OU21-MW06D to determine whether arsenic contamination in groundwater at SS035/OU-21 is migrating vertically. OU21-MW06D (screened from 25.5 ft bgs to 23.5 ft bgs) was installed adjacent to OU21-MW06 (screened from 13.5 ft bgs to 3.5 ft bgs) which contains the highest arsenic concentration observed in groundwater at the site. Groundwater sampling conducted in September 2020 indicates that arsenic is present in groundwater above both the Federal MCL and FDEP GCTL (10 µg/L) at a concentration of 60.5 µg/L at deep well OU21-MW06D. In comparison, the corresponding arsenic concentration of 692.0 µg/L detected in shallow well OU21-MW06 is one order of magnitude greater than the concentration observed in the deeper well OU21-MW06D (FPM, 2021b).

Groundwater elevations at OU21-MW06 and OU21-MW06D were recorded at 2.15 ft above NGVD 29 and 2.56 ft above NGVD 29, respectively. Calculated groundwater elevations suggest that the vertical groundwater gradient is upward, as the deeper screened well, OU21-MW06D, has a higher groundwater elevation than OU21-MW06. As a result, it is likely that the lower arsenic concentration reported in the sample from OU21-MW06D is a result of diffusion rather than vertical migration. Given this conclusion, no further sampling at OU21-MW06D was recommended. However, continued depth to groundwater measurements at OU21-MW06D was recommended to confirm this observation and to account for potential seasonal variations in groundwater elevations (FPM, 2021b).

5.5.5 Long-Term Groundwater Monitoring

In accordance with the 2006 ROD, groundwater monitoring has been completed at Site SS035/OU-21 since 2001 and has been completed biennially since 2004. Groundwater samples have been collected from eight monitoring wells located within Site SS035/OU-21 which include OU21-MW01, OU21-MW02, OU21-MW03, OU21-MW04, OU21-MW05, OU21-MW06, OU21-MW07, and OU21-MW08. OU21-MW03 was replaced by OU21-MW03R as a result of the 2018 Additional RA. There are also 14 additional monitoring wells (OU21-MW09 to OU21-MW16 and MW-A to MW-F) located at the site which are not part of the long-term groundwater monitoring program. None of these wells have been sampled since the last FYR. Monitoring well OU21-MW17 also exists at the site but is not sampled as part of the SS035/OU-21 groundwater monitoring network. OU21-MW17 was installed following the 2018 Additional RA and sampling results for this monitoring well were discussed previously in **Section 5.5.2**.

The most recent biennial groundwater sampling event was conducted in December 2020. Based on groundwater elevation data collected, the groundwater elevations measured ranged between 1.36 to 1.50 ft NGVD 29. Per the recommendations of the Draft Groundwater Vertical Migration Evaluation Report, dated June 2021, the depth to water was also collected at monitoring well OU21-MW06D. The measured depth was 5.54 ft bgs. This depth is shallower than the depth to water measured at monitoring well OU21-MW06 (6.00 ft bgs). Based on these depths to water, the groundwater elevation for OU21-MW06 and OU21-MW06D are 1.36 ft above NGVD 29 and 1.61 ft above NGVD 29, respectively. The calculated groundwater elevations confirm that the vertical groundwater gradient is upward, as the deeper screened well, OU21-MW06D, has a higher groundwater elevation than OU21-MW06 (FPM, 2022b).

All samples collected from the groundwater monitoring network monitoring wells were analyzed for total arsenic using SW-846 Method 6010D. Groundwater samples collected at OU21-MW01 (112 µg/L), OU21-MW02 (269 µg/L), OU21-MW03R (159 µg/L), OU21-MW05 (23.8 µg/L), OU21-MW06 (950 µg/L), and OU21-MW08 (16.2 µg/L) exhibited arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L in December 2020 (FPM, 2022b). From the December 2020 sampling results, it can be observed that the distribution of arsenic in the groundwater is located mostly in the northeastern section of SS035/OU-21. The highest concentrations of arsenic have been observed at OU21-MW06 (950 µg/L). The groundwater plume is delineated to the north by OU21-MW04 and delineated to the south by OU21-MW07. While monitoring wells OU21-MW01, OU21-MW02, and OU21-MW06 have consistently contained arsenic above the Federal MCL and FDEP GCTL of 10 µg/L since 2001, arsenic

concentrations at monitoring wells OU21-MW03R, OU21-MW05, and OU21-MW08, fluctuate above and below the Federal MCL and FDEP GCTL of 10 µg/L over time. In addition, a slight increase in arsenic concentrations can be observed at OU21-MW03R as compared to the other site monitoring wells that indicate a stable trend over time (no constant increases or decreases over time). Historical arsenic concentrations in the groundwater are provided in **Table 3**. The December 2020 arsenic concentrations and plume are illustrated in **Figure 7**.

5.5.6 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site SS035/OU-21 ROD. Site SS035/OU-21 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the annual inspections and interviews indicated that the site is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11E Deed EURCs (**Table 1**), and that the property owner is aware of the LUC mandatory compliance. In addition, the Additional RA field constraints and engineering controls, identified in the 2018/2019 Additional RA, were also inspected during the 2020 inspection event in accordance with the *Former Homestead AFB Long-Term Management Work Plan*, provided in **Appendix A**. These constraints, presented in **Section 5.5.1**, are also provided in **Table 1**. The inspection indicated that they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

5.6 FIVE-YEAR REVIEW PROCESS

5.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site SS035/OU-21. Relevant documents/data sources include, but are not limited to the Visual Inspection, the Confirmation Sampling Report; the 1997 RI/BRA, the 2001 IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year Review, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the Annual and Biennial Groundwater Monitoring Reports (2001 Annual Groundwater Monitoring Report through the 2018 Biennial Groundwater Monitoring Report), the 2006 Final ROD for SS035/OU-21, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2020 Additional Remedial Action Completion Report – Soil, the 2020 Groundwater Treatment Pilot Study Work Plan, the 2020 Groundwater Treatment Pilot Study Report, the 2021 Optimization Recommendations Report, and the 2020 Annual Long-Term Management Report (2020 LUC site inspections and biennial) dated 2021.

5.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ROD. No unusual observations or breaches/failures of the remedy were documented during this visit. In addition, the engineering controls/ T&ES areas were inspected, and they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

An interview with a representative of the property owner was also completed through email. The representative is aware of the LUC mandatory compliance and the boundaries of the TE&S location and engineering controls. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

5.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes,~~T~~ the remedy for Site SS035/OU-21 is functioning as intended. The ROD specifies prohibitions for excavation of soils along with residential use restrictions. The remedy also includes monitoring for groundwater with restrictions for groundwater use. The arsenic remaining in soil and groundwater does not allow for UU/UE. Based on the Additional RA completed in 2018, soil with arsenic concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site except for at two areas. Over-excavation was not conducted at the remaining areas due to field constraints, such as the presence of T&ES and an active roadway in one area and the footprint of Building 618 in another area (URS/FPM, 2020b). However, engineering controls are provided and maintained by the field constraints including the Building 618 slab, Bougainville Boulevard, and parking lot near Bougainville Boulevard which prevent future exposure to soil containing arsenic above the Commercial/Industrial SCTL of 12 mg/kg. The boundaries of the field constraints have been added to the SS035/OU-21 LUC Site Inspection program through the Former Homestead AFB Long-Term Management Work Plan and will be inspected annually (FPM, 2021c). In addition, the property owner have been notified of these boundaries through the LUC site inspection interviews. With the LUCs and inspections of field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site SS035/OU-21 under the current industrial land use scenario. Site SS035/OU-21 is vacant/open space and the property is designated for industrial use. With the LUCs and field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site SS035/OU-21 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L are confined to the northeastern portion of the site at six monitoring wells. While a groundwater treatment pilot study was completed in July 2020, arsenic concentrations in groundwater at these monitoring wells are relatively stable, with no constant increases or decreases. Continued long-term groundwater monitoring will assess the stability of the arsenic plume in accordance with the remedy selected in the ROD. The continued long-term groundwater monitoring will also monitor the effectiveness of the 2020 groundwater treatment pilot study.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Yes,~~T~~ the exposure assumptions, toxicity data, and RAOs used at the time of the remedy selection for groundwater are still valid. The groundwater RG is the Federal MCL and FDEP GCTL of 10 µg/L for arsenic.

No, the RG of 10 mg/kg for soil, captured in the 2006 ROD, has since been rejected by the USEPA for the lack of supporting documentation regarding how this value was derived. As a result, soil RGs are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No, the Additional RA completed in 2018, removed previously identified soil with arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg except for two areas. However, exposure to the residual soil contamination above FDEP Commercial/Industrial SCTL of 12 mg/kg is restricted by the presence of the T&ES and engineering controls, including an active roadway in one area, and Building 618 in the second area (**Figure 6**). The boundaries of the field constraints have also been added to the Site SS035/OU-21 LUC Site Inspection Program and will be inspected annually.

5.8 ISSUES

No issues were identified in this review for Site SS035/OU-21.

5.9 RECOMMENDATIONS

Arsenic concentrations in soil at Site SS035/OU-21 are above the FDEP Residential SCTL of 2.1 mg/kg. Therefore, continuation of annual LUC site inspections and FYRs are recommended. Two areas within the site also contain arsenic concentrations in soil above the FDEP Commercial/Industrial SCTL of 12 mg/kg. However, exposure to the residual soil contamination above FDEP Commercial/Industrial SCTL of 12 mg/kg is restricted by the presence of T&ES and through engineering controls. While these constraints restrict exposure to the residual soil contamination, they are located within property designated for future re-development and could potentially be removed. Therefore, verification that these constraints still exist is to be conducted during the annual LUC site inspections. The field constraints boundaries and inclusion of their inspection in the annual LUC Site Inspection Program have been implemented at the site through the Former Homestead AFB Long-Term Management Work Plan (FPM, 2021c).

In addition, arsenic concentrations in groundwater at the site are also above the Federal MCL and FDEP GCTL of 10 µg/L; therefore, continuation of biennial groundwater monitoring is also recommended.

5.10 PROTECTIVENESS STATEMENT

The remedy at Site SS035/OU-21 is protective of human health and the environment.

5.11 NEXT REVIEW

Site SS035/OU-21 will be subject to the next FYR. The next FYR is due January 12, 2026.

6.0 SITE OT022/OU-26

6.1 BACKGROUND

6.1.1 Physical Characteristics

Site OT020/OU-26 is located at the eastern corner of the intersection of Bikini Boulevard and Bougainville Boulevard, in the east-central portion of the former base (**Figure 8**) in Parcel 11E. OT020/OU-26 includes the Aircraft Fabrication Facility (Building 745) and a sheltered concrete slab (Building 746) adjacent to the southeast. Site OT020/OU-26 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County and encompasses an area of approximately 2.64 acres. The site is in an unpopulated area with no active businesses or residences nearby.

In December 2012, September 2017, and March 2018, T&ES Surveys of areas in and around the vicinity of Site OT020/OU-26 were conducted. No occurrences of protected flora or fauna were noted in any of the events (URS/FPM, 2020c).

6.1.2 Land and Resource Use

The Aircraft Fabrication Facility was formerly used for the maintenance of aircraft skin and hydraulics. Building 745 was partially repaired after Hurricane Andrew but is currently unoccupied. There are currently no plans to occupy the facility. Immediately south-southeast of Building 745 is a sheltered concrete slab (Building 746) that was used to store gas cylinders and chemicals. Two flammable material storage lockers were located southwest of this area. Two USTs were located immediately northeast of Building 746 and were removed in 1994.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

A small canal is present along the northeastern boundary of Site OT022/OU-26. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. Groundwater beneath the site has not been used for drinking water purposes and there are no plans to do so.

6.1.3 Site Chronology

A list of important Site OT022/OU-26 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1994	Confirmation Sampling
1994	UST Removal

Date	Event
1996	IRA
1997	RI/BRA
March 29, 1999	Final ROD Signed
1999	ROD Implementation
2000	Final ROD Implementation Report
November 1999 – April 2004	Quarterly Natural Attenuation Groundwater Monitoring
May 2003	First FYR
April 2006	2006 Biennial Groundwater Monitoring
April 2008	2008 Biennial Groundwater Monitoring
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
February 2010	2010 Biennial Groundwater Monitoring
2013	Site Investigation/Re-evaluation
March 2013	2012 Biennial Groundwater Monitoring
February 6, 2014	Final ESD signed
October 2014	2014 Biennial Groundwater Monitoring
January 2015 – September 2016	Third FYR
October 2016	2016 Biennial Groundwater Monitoring
April 2018 – September 2019	Additional Remedial Action
October 2018	2018 Biennial Groundwater Monitoring
October 2018 – February 2020	Post Additional Remedial Action Groundwater Sampling
December 2019 – March 2020	Groundwater Treatment
December 2020	2020 Biennial Groundwater Monitoring

6.1.4 History of Contamination

Building 745 was formerly used for the maintenance of aircraft skin and hydraulics. The southeast portion of the building was reportedly used for lead-acid battery storage. Three transformers were stored in a fenced area at the eastern corner of the building. The transformers were removed after 1993 with no evidence of leakage. Building 745 was equipped with a floor drain system that discharged via an underground industrial waste line to the large ditch located east of the building. The ditch is normally dry except during periods of heavy rainfall. A small sump located adjacent to the eastern corner of Building 745 also discharged to the ditch via a separate underground waste line.

Building 746 was used to store gas cylinders, flammable materials, and storage cabinets containing paints, solvents, and driveway sealer. The two USTs contained fuel.

6.1.5 Initial Response and Basis for Action

Confirmation sampling was performed at Site OT022/OU-26 in 1994. Confirmation sampling groundwater samples indicated the presence of significant levels of cis-1,2-dichloroethene (DCE), 1,2-DCE, tetrachloroethene (PCE), trichloroethylene (TCE), and vinyl chloride (VC) above the FDEP groundwater cleanup guidance levels in effect at the time. In surface soil samples, PAHs,

pesticides, and polychlorinated biphenyls were detected. Total PAH concentrations in soils ranged from 2.02 to 24.62 mg/kg. Aroclor-1254 was detected at 1,400 micrograms per kilogram (µg/kg) and 4,4'-dichloro-diphenyl-dichloroethane, 4,4'-dichloro-diphenyl-dichloroethene, 4,4'-dichloro-diphenyl-trichloroethane, aldrin, endrin ketone, and heptachlor epoxide were detected at concentrations ranging from 0.5 to 25 µg/kg. In addition, 11 metals were detected above background concentrations in soils, including arsenic at 123 mg/kg, chromium at 86 mg/kg, and lead at 506 mg/kg (Woodward-Clyde, 1995).

In January 1994, two steel USTs located just northeast of Building 746 were removed. While it was noted that the tanks were in good condition, petroleum sheen was observed on the exposed groundwater in the excavation. The distribution lines were capped, and soils were removed, with sidewall samples screened for organic vapors until found to be below l0 parts per million (ppm). All excavated soils were transported off site to a thermal treatment facility. Five monitoring wells sampled near the area showed low concentrations of cis/trans-1,2-DCE and TCE (OHM, 1999).

In 1996, IRAs were completed to remove arsenic-contaminated soil. Two excavations were completed to a depth of approximately 2 ft bgs. Approximately 240 tons of soil was excavated. Once this action was completed, monitoring wells installed within the excavations indicated the presence of arsenic in the groundwater.

In 1996, tracer studies were also performed to determine the discharge points of floor drains located within Building 745. The tracer study indicated that pipes within the building were discharging directly to the canal northeast of Building 745 and indicated the location of a sump discharge at the southeast corner of the building. Sediment and soil samples were collected at each canal discharge point, above the water line. The contents of the sump were also sampled. Relatively high levels of volatile organic compounds (VOCs) were detected in the canal sediments collected where the floor drains discharged to the canal. Additionally, PAHs were detected in the sediment at the discharge points and in the sample of sludge collected from the sump within the piping system. The floor drain system was subsequently plugged and later removed as a possible source area for continued groundwater contamination.

The RI/BRA was completed in 1997, which included surface and subsurface soil, groundwater, surface water, and sediment sampling. Surface soil samples results showed mercury and lead concentrations above FDEP Commercial/Industrial SCTLs. Results from the subsurface soil samples were below FDEP Commercial/Industrial SCTLs. Sampling results from two monitoring wells reported chlorinated VOCs concentrations above Federal MCLs and FDEP GCTLs. The chlorinated VOCs detected in exceedance of the Federal MCLs and FDEP GCTLs included TCE with a maximum concentration of 1,600 µg/L, perchloroethylene at 3 µg/L, cis-1,2-DCE at 470 µg/L, and VC at 7 µg/L. Surface water and sediment sampling results were below FDEP criteria. Results of the BRA indicated that there are potential unacceptable risks associated with exposure to groundwater and surface soil at the site (Woodward-Clyde, 1997).

During May 2002, the discharge piping, and surrounding soils (from the point at which the floor drain system exits Building 745 to a point up gradient of monitoring well OU26-SM60-MW01), were removed. The excavation was backfilled with crushed stone and a biomass amendment composed of plant mulch.

6.2 OT022/OU-26 RECORD OF DECISION

The ROD for Site OT022/OU-26 was finalized in October 1998 and signed in March 1999. The selected remedy included soil removal and groundwater remediation (monitoring natural attenuation [MNA]) with groundwater restrictions (Montgomery Watson, 1998).

An ESD was signed by the USEPA on February 6, 2014 and is provided in **Appendix A**. The purpose of the ESD was to formally document the inclusion of LUCs as part of the remedy for Site OT022/OU-26 (AFCEC, 2013). The Site OT022/OU-26 LUCs objectives are to:

- Prevent residential use, including use of the property for hospitals for human care, public or private school for persons under 18 years of age, or daycare centers for children.
- Prevent exposure to the subsurface soils, by preventing digging, excavating or conducting any other activity that would disturb the surface cover without coordinating such efforts and obtaining approval from the FDEP, USEPA, and the Air Force, or their successors.
- Prevent exposure to the groundwater, by prohibiting the consuming, causing exposure to, or otherwise using the groundwater for any purpose whatever, without coordinating such efforts and obtaining approval from the FDEP, USEPA, and the Air Force, or their successors.
- Prevent actions that disturb, move, damage, mar, tamper with, interfere with, obstruct, or impede any wells and treatment facilities and systems, and related piping used in the environmental remediation and restoration on the property.

6.2.1 Remedy Selection

The RAOs specified for Site OT022/OU-26 in the 1998 ROD are as follows:

- Prevent human and ecological exposure to surface soils at Site OT022/OU-26 that contain PAHs, lead, mercury, and arsenic at concentrations above the FDEP Commercial/Industrial SCTLs.
- Prevent construction worker dermal contact with groundwater at Site OT022/OU-26 that contains TCE at concentrations above the risk-based concentration of 580 µg/L.

The remedies selected for this site as identified in the final ROD are as follows.

Soil: Removal of soils containing arsenic at levels above the alternate industrial SCTL/RG (10 mg/kg) for disposal in a solid waste (RCRA Subtitle D) landfill and implementation of LUCs associated with residual soil contamination.

Groundwater: Long-term groundwater monitoring of TCE in groundwater, MNA of the TCE plume, and implementation of institutional controls. Natural attenuation involves all naturally

occurring processes that reduce contaminant concentrations over time. These in situ processes (intrinsic remediation) include biodegradation, abiotic transformation, dispersion, adsorption, and volatilization.

6.3 REMEDY IMPLEMENTATION

6.3.1 1999 Soil Removal

A RA was conducted at Site OT022/OU-26 between May 1999 and September 1999. Approximately 250 tons of contaminated soil were removed from three separate excavation areas and transported off site for disposal. The RGs for arsenic and B(a)P were 10 mg/kg and 1.5 mg/kg, respectively. Confirmatory soil sampling indicated that arsenic and B(a)P concentrations were below the RGs at two of the three excavations (OHM, 2000). Additional excavation and sampling was not conducted as the excavations extended to or past 2 ft bgs which is below the direct exposure pathway.

6.3.2 Groundwater Monitoring

In accordance with the approved ROD, the first quarterly groundwater samples were collected during the week of November 29, 1999. Groundwater samples were collected quarterly from November 1999 through April 2004. The groundwater samples were analyzed for VOCs and the following natural attenuation parameters: nitrite-nitrate nitrogen, sulfate, total organic carbon, methane, ethane, and ethane. The results of the sampling indicated exceedances of TCE, DCE, and VC. Of the natural attenuation parameters sampled, only methane, nitrate-nitrogen, sulfate, and total organic carbon were detected. In 2004, the sampling frequency was revised to biennial and has been completed through 2020. As groundwater monitoring is ongoing and the latest event was completed in December 2020, the results from the most recent monitoring event and historical data comparison are provided in the ***Progress Since the Last Review*** section to provide chronological descriptions of tasks completed since the last FYR.

6.3.3 Pipe Excavation and Biomass Addition

In May 2002, excavation of the effluent pipe, suspected of contributing to the contamination, was conducted. The discharge piping and surrounding soils were excavated and removed from the point at which the industrial waste line exits Building 745 to a point up gradient of monitoring well OU26-SM60-MW01. The pipe was composed of vitrified clay segments that were connected together with watertight gasket seals. Approximately 30 ft of the discharge piping were removed. The depths of the discharge pipeline ranged from between 3 and 5 ft bgs. The excavation was approximately 1.5 ft wide and extended 25 ft north from Building 745 beginning approximately 10 ft from the edge of the building. The excavation was then extended east (at the elbow) an additional 25 ft. The depth of the trench ranged from 5 to 8.5 ft bgs. The discharge pipe was grouted shut where it was disconnected from the building drain system. The trench was then backfilled with clean gravel and a biomass amendment. The biomass amendment consisted of plant mulch and was intended to enhance the natural attenuation process at the site by adding a source of organic carbon and lowering dissolved oxygen concentrations in the shallow aquifer, making it anaerobic or oxygen deficient (URS/FPM, 2016).

6.3.4 Land Use Controls

Annual deed restrictions inspections were completed from 2008 until the ESD was signed in 2014. The purpose of the ESD was to formally implement LUCs as part of the selected remedy and since 2014, annual LUC site inspections have been performed at the site to ensure that the LUCs continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

6.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site OT022/OU-26 to determine the extent and concentrations of the remaining arsenic and B(a)P concentrations in the soil and VOCs in groundwater. The SI/Re-evaluation included soil sampling at 35 soil borings and groundwater sampling at nine monitoring wells (URS/FPM, 2013). Soil sampling results confirmed arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg and calculated B(a)P concentrations above the FDEP Residential SCTL of 0.1 mg/kg were present at the site. The maximum arsenic concentration was 92.5 mg/kg and the maximum calculated B(a)P concentration was 4.0 mg/kg. Groundwater sampling results showed TCE concentrations above the FDEP GCTL of 3 µg/L and Federal MCL of 5 µg/L at OU26-IMW03 (14.9 µg/L) (URS/FPM, 2013). Details for the 2013 SI/Re-evaluation can be found in the Final Site Investigation Report, dated September 2013 (URS/FPM, 2013).

6.5 PROGRESS SINCE THE LAST REVIEW

The Third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the Third FYR, "the selected remedy at Site OT022/OU-26 is protective of human health and the environment in the short-term and will be protective in the long-term once the areas of additional arsenic and B(a)P contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing an Additional RA. The ongoing natural attenuation groundwater monitoring program shows that there is an overall downward trend and the remedy is protective in the short-term based on restrictions for using groundwater. The remedy will be protective in the long-term once the areas of increasing TCE concentrations in groundwater are addressed". As a result, the Third FYR recommended an Additional RA to address soils above the FDEP Commercial/Industrial SCTLs for industrial land use for long-term protectiveness of the remedy selected in the ROD. In addition, it was recommended that the USAF implement a pilot study to determine the feasibility of accelerating the degradation of chlorinated hydrocarbons in the groundwater. The Additional RA was completed in 2018 and 2019 per this recommendation and is discussed below. In addition, groundwater treatment to accelerate the degradation of chlorinated hydrocarbons in the groundwater was completed in 2019 per this recommendation and is also discussed below. This section also includes the descriptions and results of additional activities completed since the third FYR, including the post soil removal groundwater monitoring and the ongoing long-term groundwater monitoring, that is conducted in accordance with the ROD.

6.5.1 Additional Remedial Action - Soil

An Additional RA was conducted at three areas within Site OT022/OU-26, which was originally identified during the 2013 SI/Re-evaluation, and included excavating impacted soil with arsenic and B(a)P concentrations exceeding the FDEP Commercial/Industrial SCTL of 12 mg/kg and FDEP Residential SCTL of 0.1 mg/kg, respectively. Approximately 1,200 tons of arsenic contaminated soil was removed to 2 ft bgs at Excavation Area 1 and to 4 ft bgs at Excavation Areas 2 and 3. The excavation areas are illustrated in **Figure 8**. Confirmatory sampling completed prior to site restoration activities confirmed that arsenic and B(a)P concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site (URS/FPM, 2020c).

6.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil. Sampling was conducted at OU26-MW09 in December 2018, March 2019, June 2019, and September 2020 for arsenic analysis. Arsenic concentrations were detected above the Federal MCL and FDEP GCTL of 10 µg/L in December 2018 at 195 µg/L, in March 2019 at 120 µg/L, in June 2019 at 143 µg/L, and in September 2020 at 177 µg/L. Sampling was conducted at OU26-MW10 in October 2019, February 2020, and September 2020 for PAH analysis. All analytes, including B(a)P, were non-detect (FPM, 2021d). Post soil removal groundwater monitoring was also performed at monitoring wells associated with the current Site OT022/OU-26 groundwater monitoring network in October 2018. OU26-SM60-MW01, OU26-MW01D, OU26-MW02, OU26-MW03, OU26-IMW03, and OU26-MW06 were analyzed for arsenic and VOCs. Arsenic concentrations were not detected in any of the samples (FPM, 2021d). The October 2018 biennial monitoring event at the site indicated that TCE was slightly above the FDEP GCTL of 3 µg/L at 4.4 µg/L (OU26-IMW03) (FPM, 2021d). Therefore, additional sampling at one monitoring well, OU26-IMW03, was conducted in March 2019, June 2019, and August 2019 to determine if the TCE concentrations would decrease below the Federal MCL (5 µg/L) and FDEP GCTL (3 µg/L). TCE concentrations remained above the FDEP GCTL of 3 µg/L with concentrations at 3.9 µg/L, 3.4 µg/L, and 3.4 µg/L, respectively. However, these results are below the Federal MCL of 5 µg/L and the June 2019 and August 2019 results are equal 3 µg/L based on the FDEP Rounding Analytical Data for Site Rehabilitation Completion Memorandum dated November 17, 2011 (https://floridadep.gov/sites/default/files/RoundingAnalyticalData_17Nov11.pdf).

6.5.3 Additional Remedial Action – Groundwater Treatment

In December 2019, ABC® was injected into the groundwater to aid in anaerobic degradation of contaminant TCE at Site OT022/OU-26. The injections were focused around monitoring well OU26-IMW03, which historically contained the highest concentrations of TCE at the site. Approximately 7,500 lbs of ABC® mixed with 7,500 gallons of potable water was injected through a 10-ft column, from 14.5 ft bgs to 4.5 ft bgs, at 25 points to cover an approximate area of 7,850 square ft (FPM, 2021d). The injection points are illustrated in **Figure 9**.

Post-injection groundwater sampling was performed approximately 3 months after the ABC® injection on March 10, 2020 to monitor the effectiveness of the ABC® groundwater treatment. Samples were collected from three monitoring wells, OU26-IMW03, OU26-MW04, and OU26-MW06, and analyzed for VOCs, total petroleum hydrocarbon, ethanol (also called ethyl alcohol), sodium, chloride, and total dissolved solids. The monitoring wells are illustrated in **Figure 9.** Note that during this March sampling event, one monitoring well OU26-MW02, could not be sampled due to an obstruction of heavy vegetation which prevented insertion of the sampling tubing. Additional sampling was conducted at OU26-MW09 in September 2020 as this well was included in the 2018 Additional RAP to be sampled following the groundwater treatment but was not sampled during the March 2020 event. The sample was also analyzed for the above analytes. TCE was detected in the sample from OU26-IMW03 with a concentration of 2.7 µg/L, which is below both the Federal MCL of 5 µg/L and FDEP GCTL of 3 µg/L. All other analytes were below the Federal MCLs and FDEP GCTLs in the sample from OU26-IMW03. All analytes were also below the Federal MCLs and FDEP GCTLs in samples from OU26-MW04, OU26-MW06, and OU26-MW09.

6.5.4 Long-Term Groundwater Monitoring

Groundwater monitoring was initiated in 1999 in accordance with the approved ROD for VOCs and natural attenuation parameters analysis. In 2004, the frequency of the groundwater monitoring at Site OT022/OU-26 was revised to occur on a biennial basis and has been completed through 2020. The primary COCs at Site OT022/OU-26, per the ROD, are chlorinated VOCs, PCE, TCE, cis-1,2-DCE, and VC. Recently, arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L were detected during post Additional RA groundwater monitoring at OU26-MW09. It should be noted that arsenic analysis was completed at the monitoring wells in the groundwater monitoring network during the 2018 biennial event. Results from the other monitoring wells indicated that arsenic was below the Federal MCL and FDEP GCTL of 10 µg/L.

The most recent biennial groundwater sampling event was conducted in December 2020. Groundwater samples were collected from OU26-SM60-MW01, OU26-MW01D, OU26-MW03, OU26-IMW03, OU26-MW04, OU26-MW06, and OU26-MW09 for VOCs analysis (Halogenated List) by SW-846 8260C. Monitoring well OU26-MW09 was also analyzed for arsenic by SW-846 Method 6010D and monitoring well OU26-MW10 sampled for PAHs by SW-846 Method 8270D. The monitoring wells at this site are illustrated in **Figure 9**.

Based on groundwater elevation data collected, the groundwater elevations ranged from 1.36 to 1.57 ft NGVD 29. In general, the groundwater flow direction at the base is to the southeast as illustrated in **Figure 9**. All VOC concentrations were below Federal MCLs and FDEP GCTLs in this monitoring event which is the fourth consecutive monitoring event in which VOC concentrations were below the Federal MCLs and below/equal to the FDEP GCTLs (FPM, 2022b). In addition, B(a)P was not detected at OU26-MW10. Arsenic was detected above the Federal MCL and FDEP GCTL of 10 µg/L at monitoring well OU26-MW09 (150 µg/L). The arsenic concentrations detected at OU26-MW09 have ranged from 120 µg/L to 195 µg/L from 2018 through 2020. Arsenic analysis was completed in samples collected from OU26-SM60-MW01, OU26-MW01D, OU26-MW02, OU26-MW03, OU26-IMW03, OU26-MW06 in the 2018 biennial monitoring event (October 2018). All arsenic concentrations were below the Federal MCL and

FDEP GCTL of 10 µg/L. It was recommended in the Former Homestead AFB Annual Long-term Management Report that biennial groundwater monitoring continue at OT022/OU-26 for arsenic analysis only at OU26-MW09 and nearby monitoring wells, OU26-IMW03 and OU26-MW06 to track arsenic impacted groundwater migration at the site (FPM, 2022b). Historical TCE and arsenic concentrations in the groundwater are provided in **Table 4**. The December 2020 TCE and arsenic concentrations and arsenic plume are illustrated in **Figure 9**.

6.5.5 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site OT022/OU-26 ESD. Site OT022/OU-26 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. An unauthorized excavation was present near the southwest corner of Building 745 around a sewer manhole during the 2018, 2019, and 2020 inspections. Based on the interview with the property owner, the unauthorized excavation was restored as of January 2021. There have been no other unusual observations or breaches/failures of the remedy since the last FYR. In addition, there were no land-use changes that would impact the Parcel 11E Deed EURCs (**Table 1**) and the property owner is aware of the LUC mandatory compliance.

6.6 FIVE-YEAR REVIEW PROCESS

6.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site OT022/OU-26. Relevant documents/data sources include, but are not limited to the Visual Inspection, the Confirmation Sampling Report, the UST Removal report; the IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the Annual and Biennial Groundwater Monitoring Reports (2001 Annual Groundwater Monitoring Report through the 2018 Biennial Monitoring Report), the 1998 Final ROD for Site OT022/OU-26, signed March 1999, the 2013 ESD signed February 2014, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2020 Additional Remedial Action Completion Report – Soil, the 2021 Groundwater Treatment and Optimization Recommendations Report, and the 2020 Long-Term Management Report (2020 LUC site inspection and biennial groundwater monitoring) dated 2021.

6.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ESD. A portion of Site OT022/OU-26 is located within the restricted boundaries of the Homestead ARB near the flight line and a portion of the site is within an unrestricted access area. Based on the visual inspection, Site OT022/OU-26 is not utilized for residential, hospital, or school use and there is no evidence of groundwater withdrawal. A mattress was observed in Building 745, but it does not appear that this area is being used as a permanent dwelling and that this is general rubbish. During the on-site

inspection an unauthorized excavation previously observed in 2018, was still present near the southwest corner of Building 745 around a sewer manhole.

An interview with representatives of both Miami-Dade County and the Homestead ARB were completed through email. In summary, the representatives are aware of the LUC mandatory compliance. In addition, based on a follow-up with Miami-Dade County, the previously observed unauthorized excavation near the southwest corner of Building 745 around a sewer manhole has been restored as of January 2021. Photos received from the representative of Miami-Dade County in their email response confirms the restoration (**Appendix B**).

6.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, the remedy for Site OT022/OU-26 is functioning as intended. The 1999 ROD specifies MNA for groundwater and No Further Action (NFA) for soil, as residual contamination remains above UU/UE levels. The property transfer deed contains LUCs in the form of EURCs. The ESD was signed on February 6, 2014 making the LUCs part of the ROD. Based on the Additional RA completed in 2018 and 2019, soil with arsenic and PAHs, including B(a)P, concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site. Site OT022/OU-26 includes the vacant Building 745 and open space which is designated for industrial use. With the LUCs in place, there are no unacceptable risks to human health posed by soil contamination at Site OT022/OU-26 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Evidence from the natural attenuation monitoring supports the conclusion that reductive dechlorination is occurring at the site as all chlorinated VOCs, including TCE, are now detected at concentrations below the Federal MCLs and FDEP GCTLs. However, post soil removal groundwater monitoring indicated the presence of arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L at one monitoring well (OU26-MW09). Arsenic analysis at this monitoring well has been added to the Site OT022/OU-26 groundwater monitoring network to monitor arsenic trends.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Yes, the exposure assumptions, toxicity data, and RAOs used at the time of the remedy selection for groundwater are still valid. The groundwater RG is the Federal MCL and FDEP GCTL of 10 µg/L for arsenic. The groundwater RG for TCE is the Federal MCL of 5 µg/L and FDEP GCTL of 3 µg/L.

No, the soil RGs of 10 mg/kg for arsenic and 1.5 mg/kg for PAHs, captured in the 1998 ROD, have since been rejected by the USEPA for the lack of supporting documentation regarding how the values were derived. As a result, soil RGs for arsenic and PAHs (including B(a)P) are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP Residential SCTL for B(a)P is

0.1 mg/kg and the FDEP Commercial/Industrial SCTL for B(a)P is 0.7 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No, the Additional RA completed in 2018 and 2019 removed previously identified soil with arsenic and B(a)P concentrations above the FDEP Commercial/Industrial SCTLs from the site. In addition, the unauthorized excavation near the southwest corner of Building 745 around a sewer manhole, first observed in 2018, has been restored as of January 2021.

6.8 ISSUES

No issues were identified in this review for Site OT022/OU-26.

6.9 RECOMMENDATIONS

Arsenic and B(a)P concentrations in soil at Site OT022/OU-26 are above FDEP Residential SCTLs of 2.1 mg/kg and 0.1 mg/kg, respectively. Therefore, continuation of annual LUC site inspections and FYRs are recommended. In addition, arsenic concentrations in groundwater at the site are also above the Federal MCL and FDEP GCTL of 10 µg/L; therefore, continuation of biennial groundwater monitoring is also recommended.

6.10 PROTECTIVENESS STATEMENT

The remedy at Site OT022/OU-26 is protective of human health and the environment.

6.11 NEXT REVIEW

Site OT022/OU-26 will be subject to the next FYR. The next FYR is due January 12, 2026.

7.0 SITE OT024/OU-28

7.1 BACKGROUND

7.1.1 Physical Characteristics

Site OT024/OU-28 occupies approximately 4 acres located in the southwestern portion of the Former Homestead AFB (**Figure 10**) in Parcel 11E. An OWS and sump were located in the southwest portion of the site. Five USTs associated with electroplating operations at the facility were located at the northwest corner of the building, near Bikini Boulevard. Building 744, an aboveground storage tank (AST), and Building 743, an emergency electrical generation building, are located to the south of the site. Site OT024/OU-28 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County. The site is in an unpopulated area with no active businesses or residences nearby. Only workers may access the site periodically. There are no known environmentally sensitive areas on the site.

In December 2012, September 2017, and March 2018, T&ES Surveys of areas in and around the vicinity of Site OT024/OU-28 were conducted. No occurrences of protected flora or fauna were noted at Site OT024/OU-28 in any of the events (URS/FPM, 2021b).

7.1.2 Land and Resource Use

Site OT024/OU-28 was formerly used for jet engine teardown, rebuilding, inspection and repair since approximately 1950. In the past, waste oils were collected in a mobile, 500-gallon capacity AST that was approximately 75 percent full and was located on the asphalt drive at the southeast end of the building during the 1993 visual inspection.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

There is no surface water present at Site OT024/OU-28. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. Groundwater beneath the site has not been used for drinking water purposes and there are no plans to do so.

7.1.3 Site Chronology

A list of important Site OT024/OU-28 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1993	Visual Inspection
1993-1994	OWS Removal
1994	UST Removal
1997	RI/BRA
March 29, 1999	Final ROD Signed
1999	ROD Implementation
2000	Final ROD Implementation Report
November 2002	Abandonment of 15 monitoring wells
May 2003	First FYR
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
2013	Site Investigation/Re-evaluation
February 6, 2014	Final ESD signed
January 2015 – September 2016	Third FYR
April 2018 – March 2019	Additional Remedial Action
March 2019 – May 2020	Post Additional Remedial Action Groundwater Sampling

7.1.4 History of Contamination

Removal of the OWS and its associated sump was conducted between December 1993 and February 1994. At that time, the floor drains in the building and on the concrete pad were grouted. A two-phase subsurface investigation was completed at the sump/separator area in March-May 1994 and November 1994. Sampling indicated the presence of toluene, total recoverable petroleum hydrocarbons (TRPH), and benzene. Groundwater samples indicated the presence of PCE, TCE, naphthalene, l-methylnaphthalene, 2-methylnaphthalene, arsenic, chromium, and lead.

Removal of the USTs was conducted in March 1994. There was no visible evidence of leakage from the USTs to the surrounding site media. Soil samples taken from the excavation indicated no exceedances. Four monitoring wells were subsequently installed. Samples of the groundwater indicated no exceedances.

7.1.5 Initial Response and Basis for Action

A RI/BRA was conducted at Site OT024/OU-28 in 1997, which included surface soil, subsurface soil, and groundwater sampling. Arsenic concentrations were detected above FDEP Commercial/Industrial SCTLs in surface soil surrounding Building 744 (Woodward-Clyde, 1997). Results for subsurface soil samples were all below FDEP Commercial/Industrial SCTLs and results for groundwater samples within the area of the former OWS location showed chlorinated VOC concentrations above Federal MCLs and FDEP GCTLs. Further investigation during the RI via Geoprobe® indicated that these concentrations were localized, and most were at or below Federal MCLs and/or FDEP GCTLs. Groundwater samples collected from two wells were analyzed for VOCs, PAHs, and total lead. No Federal MCL and FDEP GCTL exceedances were detected. Results of the BRA at Site OT024/OU-28 showed potential unacceptable ecological risk due to high concentrations of lead in surface soil. Additionally, concentrations of PAHs, lead, and arsenic that also exceeded the FDEP Commercial/Industrial SCTLs were detected in surface soils at Site OT024/OU-28 (Woodward-Clyde, 1997).

Based on the results of the FS and the Proposed Plan, a ROD was developed for Site OT024/OU-28.

7.2 OT024/OU-28 RECORD OF DECISION

The OT024/OU-28 ROD was finalized in October 1998 and signed in March 1999. The remedy for soil was completed with residual soil contamination for lead, arsenic, and PAHs present above residential SCTLs (Montgomery Watson, 1998).

An ESD was signed by the USEPA on February 6, 2014 (AFCEC, 2013). The purpose of the ESD was to formally document the inclusion of LUCs as part of the remedy for Site OT024/OU-28 (AFCEC, 2013). The Site OT024/OU-28 LUCs objectives are to:

- Prevent residential use, including use of the property for hospitals for human care, public or private school for persons under 18 years of age, or daycare centers for children.

- Prevent exposure to the subsurface soils, by preventing digging, excavating or conducting any other activity that would disturb the surface cover without coordinating such efforts and obtaining approval from the FDEP, USEPA, and the Air Force, or their successors.

- Prevent exposure to the groundwater, by prohibiting the consuming, causing exposure to, or otherwise using the groundwater for any purpose whatever, without coordinating such efforts and obtaining approval from the FDEP, USEPA, and the Air Force, or their successors.

- Prevent actions that disturb, move, damage, mar, tamper with, interfere with, obstruct, or impede any wells and treatment facilities and systems, and related piping used in the environmental remediation and restoration on the property.

7.2.1 Remedy Selection

The RAO specified for Site OT024/OU-28 in the 1998 ROD is to:

- Prevent human and ecological exposure to surface soils at Site OT024/OU-28 that contain PAHs, lead, and arsenic at concentrations above the soil cleanup goals per the 1998 ROD, including: B(a)P (1.5 mg/kg), lead (1,000 mg/kg), and arsenic (10 mg/kg).

The remedies selected for this site as identified in the ROD are as follows.

Soil: Per the ROD, Remove and Landfill was chosen as the appropriate RA for this site (Montgomery Watson, 1998). The alternative involves removal of contaminated soils exceeding industrial SCTLs for disposal in a solid waste (RCRA Subtitle D) landfill.

7.3 REMEDY IMPLEMENTATION

7.3.1 1999 Soil Removal

An RA was conducted at Site OT024/OU-28 between May 1999 and September 1999. Approximately 1,450 tons of contaminated soil/limestone were removed from five separate excavation areas to a depth of 2 ft bgs and transported off site for disposal. Confirmatory soil sampling indicated that arsenic and B(a)P concentrations were still present in soils at concentrations above the RGs of 10 mg/kg and 1.5 mg/kg, respectively (OHM, 2000). Arsenic concentrations above the RG of 10 mg/kg ranged from 11 mg/kg to 35 mg/kg and B(a)P concentrations above the RG of 1.5 mg/kg ranged from 1.6 mg/kg to 3 mg/kg. Additional excavation was not conducted as the excavations extended to 2 ft bgs which is below the direct exposure pathway. In addition, the sidewalls with the exceedances were bordered by asphalt cover.

7.3.2 Land Use Controls

Annual deed restrictions inspections were completed from 2008 until the ESD was signed in 2014. The purpose of the ESD was to formally implement LUCs as part of the selected remedy and since 2014, annual LUC site inspections have been performed at the site to ensure that the LUCs

continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

7.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site OT024/OU-28 to determine the extent and concentrations of the remaining COCs in the soil. The SI/Re-evaluation included soil sampling at 78 soil borings and groundwater sampling at one monitoring well (URS/FPM, 2013).

The soil samples were analyzed for arsenic by SW-846 Method 6010C, PAHs by SW-846 Method 8270D, metals by SW-846 Method 6010C, and Heptachlor Epoxide by SW-846 Method 8081B. Results showed arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg at six locations and calculated B(a)P concentrations above the FDEP Residential SCTL of 0.1 mg/kg at 11 locations. No other analytes were detected at concentrations above FDEP Commercial/Industrial SCTLs. A groundwater sample was analyzed for arsenic by SW-846 Method 6010C. Analytical results indicated an elevated arsenic concentration of 49 µg/L, above the Federal MCL and FDEP GCTL of 10 µg/L. Details for the 2013 SI/Re-evaluation can be found in the Final Site Investigation Report, dated September 2013 (URS/FPM, 2013).

7.5 PROGRESS SINCE THE LAST REVIEW

The Third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the Third FYR, "based on the completed RA, the intent and goals of the ROD have been met at Site OT024/OU-28. The remedy at Site OT024/OU-28 is protective of human health and the environment in the short-term based on the LUCs that are in place. The remedy will be protective in the long-term once the areas of additional arsenic and B(a)P contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing an Additional RA". As a result, the Third FYR recommended that an Additional RA for removing soils above the FDEP Commercial/Industrial SCTLs for industrial land use be conducted for long-term protectiveness of the remedy selected in the ROD. The Additional RA was completed in 2018 and 2019 per this recommendation and is discussed below. This section also includes the descriptions and results of additional activities completed since the Third FYR, including post soil removal groundwater monitoring.

7.5.1 Additional Remedial Action – Soil Removal

An Additional RA was initiated in April 2018 by excavating impacted soils at 13 areas identified during the 2013 SI/Re-evaluation, and at three areas identified during confirmatory sampling within OT024/OU-28, during the 2013 SI-Re-evaluation. Approximately 2,450 tons of contaminated soil at the 16 areas were removed and restored to original grade with clean fill comprised of lime rock from a local quarry. These areas were identified as Excavation Areas 1 through 12, 1-2, S23, S26, and S37 which are illustrated in **Figure 11**. The excavation depths ranged from 2 ft bgs to 4 ft bgs (URS/FPM, 2021b). During the excavation activities, an unidentified OWS was found. A removal action for this OWS is pending. Confirmatory soil

samples were collected from the walls and bottom surface at each excavation area. The laboratory results indicated that arsenic concentrations were below the FDEP Commercial/Industrial SCTL of 12 mg/kg at all excavations (URS/FPM, 2021b). For B(a)P, the FDEP Commercial/Industrial SCTLs of 0.7 mg/kg could not be achieved at Excavation Areas 1-2, 4, and 10. For B(a)P, the FDEP Commercial/Industrial SCTLs of 0.7 mg/kg could not be achieved within three areas at the site, specifically Excavation Areas 1-2, 4, and 10. The presence of field constraints, including demolition debris, an OWS, a storm water drainage ditch, and a former building's slab, collectively limited the extent of soil excavation in these three areas. The field constraint boundaries are illustrated in **Figure 10**. The field constraint boundaries for Excavation Areas 1 and 2 were combined due to their proximity to each other and are identified as Area 1-2 in **Figure 10**.

7.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil. Monitoring well OU28-MW01 was sampled on March 15, 2019 and June 19, 2019, OU28-MW02 was sampled on June 19, 2019 and August 20, 2019, and OU28-MW03 was sampled on March 15, 2019 and June 19, 2019. Based on the contaminants removed in the vicinities of these monitoring wells, OU28-MW01 and OU28-MW02 were analyzed for B(a)P by SW-846 8270D and OU28-MW03 was analyzed for arsenic by SW-846 Method 6010C. OU28-MW01 was also sampled for arsenic by SW-846 Method 6010C on May 13, 2020, to evaluate the contamination in groundwater based on the sampling event from the 2013 SI/Re-evaluation. The monitoring well locations are illustrated in **Figure 11**. The analytical results at OU28-MW01 indicated B(a)P was not detected in both sampling events. Arsenic concentrations were below the FDEP GCTL of 10 µg/L during the May 2020 sampling event, with a result of 7.8 J µg/L (URS/FPM, 2021c). The qualifier J indicates a result greater than the detection limit but less than the limit of quantitation. Additional monitoring at OU28-MW01 in association with the OWS removal action was recommended in the Post Soil Removal Groundwater Monitoring Report to confirm the absence of arsenic contamination (URS/FPM, 2021c). B(a)P and arsenic were not detected in any sampling event at OU28-MW02 and OU28-MW03, respectively. No further monitoring was recommended for monitoring wells OU28-MW02 and OU28-MW03 (URS/FPM, 2021c).

7.5.3 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site OT024/OU-28 ESD. Site OT024/OU-28 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the annual inspections and interviews indicated that the site is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11E Deed EURCs, and that the property owner is aware of the LUC mandatory compliance. In addition, the Additional RA field constraints and engineering controls, identified in the 2018/2019 Additional RA, were also inspected during the 2020 inspection event in accordance with the *Former Homestead AFB Long-Term Management Work Plan*, provided in **Appendix A**. These constraints, presented in **Section 7.5.1**, are also provided in **Table 1**. The inspection indicated that they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

7.6 FIVE-YEAR REVIEW PROCESS

7.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site OT024/OU-28. Relevant documents/data sources include, but are not limited to the Visual Inspection, the OWS and UST Removal reports, the RI/BRA, the IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the 1998 Final ROD for Site OT024/OU-28, signed March 1999, the 2013 ESD signed February 2014, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2020 Additional Remedial Action Completion Report – Soil, the 2020 Additional Remedial Action Completion Report – Soil, and the 2020 Long-Term Management Report (2020 LUC site inspection) dated 2021.

7.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ESD. No unusual observations or breaches/failures of the remedy were documented during this visit. In addition, the Additional RA field constraints were inspected, and they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

An interview with a representative of the property owner was also completed through email. The representative is aware of the LUC mandatory compliance and the boundaries of the Additional RA field constraints. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

7.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, the remedy for Site OT024/OU-28 is functioning as intended. The 1999 ROD specifies NFA for soil, as residual contamination remains above UU/UE levels. The property transfer deed contains LUCs in the form of EURCs. The ESD was signed on February 6, 2014 making the LUCs part of the ROD. Based on the Additional RA completed in 2018 and 2019, soil with arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg have been removed from the site. In addition, PAHs, including B(a)P, concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site except for at six areas. Over-excavation was not conducted at the remaining areas due to field constraints, including a former building slab, demolition debris, an OWS, and a storm water drainage ditch (URS/FPM, 2021b). An engineering control is provided and maintained by one of the field constraints, the former building slab, which prevents future exposure to soil containing B(a)P above the Commercial/Industrial SCTL of 0.7 mg/kg. The boundaries of the field constraints have been added to the OT024/OU-28 LUC Site Inspection program through the Former Homestead AFB

Long-Term Management Work Plan and will be inspected annually (FPM, 2021c). In addition, the property owner have been notified of these boundaries through the LUC site inspection interviews. With the LUCs and inspections of field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site OT024/OU-28 under the current industrial land use scenario. Site OT024/OU-28 is vacant/open space and the property is designated for industrial use. With the LUCs and field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site OT024/OU-28 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

No, the soil RGs of 10 mg/kg for arsenic and 1.5 mg/kg for PAHs, captured in the 1998 ROD, have since been rejected by the USEPA for the lack of supporting documentation regarding how the values were derived. As a result, soil RGs for arsenic and PAHs (including B(a)P) are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP Residential SCTL for B(a)P is 0.1 mg/kg and the FDEP Commercial/Industrial SCTL for B(a)P is 0.7 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

Yes, while the Additional RA was completed in 2018 and 2019 to remove previously identified soil with concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg for arsenic and 0.7 mg/kg for B(a)P, an unidentified OWS was discovered during excavation activities. Removal activities of this OWS are pending.

The Additional RA also removed previously identified soil with B(a)P concentrations exceeding the FDEP Commercial/Industrial SCTL of 0.7 mg/kg, except for within four areas. Over-excavation of these areas was not feasible due to the presence of a former building slab, demolition debris, an OWS, and a storm water drainage ditch (**Figure 10**). However, exposure to the residual soil contamination above the FDEP Commercial/Industrial SCTL of 12 mg/kg for arsenic and 0.7 mg/kg for B(a)P is restricted by the presence of these constraints. The boundaries of the field constraints have also been added to the Site OT024/OU-28 LUC Site Inspection Program and will be inspected annually.

7.8 ISSUES

An unidentified OWS was discovered during the Additional RA completed in 2018 and 2019. In addition, following the 2018 and 2019 Additional RA, six areas within the site also contain B(a)P concentrations in soil above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg. However, exposure to the residual soil contamination above FDEP Commercial/Industrial SCTL is restricted

through engineering controls that include an active roadway in one area and Building 618 in the second area. (**Figure 10**).

7.9 RECOMMENDATIONS

An Additional RA for removing the unidentified OWS and any contaminated soils above the FDEP Commercial/Industrial SCTLs is recommended for long-term protectiveness of the remedy selected in the ROD.

In addition, arsenic and B(a)P concentrations in soil at Site OT024/OU-28 are above the FDEP Residential SCTL of 2.1 mg/kg and 0.1 mg/kg, respectively. Therefore, continuation of annual LUC site inspections and FYRs are recommended. Six areas within the site also contain B(a)P concentrations in soil above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg. However, exposure to the residual soil contamination above FDEP Commercial/Industrial SCTL of 0.7 mg/kg is restricted through engineering controls and other Additional RA field constraints (**Figure 10**). While these constraints restrict exposure to the residual soil contamination, they are located within property designated for future re-development and could potentially be removed. Therefore, verification that these constraints still exist is to be conducted during the annual LUC site inspections. The field constraints boundaries and inclusion of their inspection in the annual LUC Site Inspection Program have been implemented at the site through the Former Homestead AFB Long-Term Management Work Plan (FPM, 2021c).

7.10 PROTECTIVENESS STATEMENT

The selected remedy at Site OT024/OU-28 is protective of human health and the environment based on the ongoing LUCs in place at the site. However, in order for the remedy to be protective in the long-term, the removal of a previously unidentified OWS need to be completed to ensure protectiveness.

7.11 NEXT REVIEW

Site OT024/OU-28 will be subject to the next FYR. The next FYR is due January 12, 2026.

8.0 SITE OT026/OU-29

8.1 BACKGROUND

8.1.1 Physical Characteristics

Site OT026/OU-29 is located at the northeast intersection of Bikini and St. Nazaire Boulevards (**Figure 12**) in Parcel 11E. Building 760 was previously located at the site and was used as an Avionics Aerospace Ground Equipment Shop and a Tactical Electronic Warfare System Shop, and housed various associated testing shops. The building was demolished sometime prior to 1993 after being heavily damaged by Hurricane Andrew. The site currently consists of a mixture of asphalt or concrete paved areas and a grassy area covering the former building footprint. Site OT026/OU-29 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County

and is approximately 2 acres in size. The site is in an unpopulated area with no active businesses or residences nearby. Only workers may access the site periodically.

In December 2012, September 2017, and March 2018, T&ES Surveys of areas in and around the vicinity of Site OT026/OU-29 were conducted. During the 2012 and 2017 surveys, occurrences of Small's milkpea (*Galactia smallii*) were observed at the site. This is a federally protected plant. During the 2018 survey, no new occurrences of Small's milkpea were observed. No other protected flora or fauna species were noted at Site OT026/OU-29 in any of the events (URS/FPM, 2020e). The locations of the protected flora are illustrated in **Figure 12**.

8.1.2 Land and Resource Use

An OWS had been located at the southeast corner of the former Building 760. The OWS consisted of a concrete structure with associated underground influent and effluent piping. The OWS was constructed of reinforced concrete. Effluent from the OWS discharged to the north into the sanitary sewer that runs along Bikini Boulevard. Influent to the OWS was believed to have originated inside the former Building 760. A 2,000-gallon steel UST was also located adjacent to the northwest side of former Building 760. The tank was reportedly used to store diesel fuel to power a generator or boiler that was located inside Building 760.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

There is no surface water present at Site OT026/OU-29. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. Groundwater beneath the site has not been used for drinking water purposes and there are no plans to do so.

8.1.3 Site Chronology

A list of important Site OT026/OU-29 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1993	Visual Inspection
1994	OWS Removal
1994	UST Removal
1997	RI/BRA
March 29, 1999	Final ROD Signed
1999	ROD Implementation
2000	Final ROD Implementation Report
November 2002	Abandonment of 8 monitoring wells
May 2003	First FYR
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
2013	Site Investigation/Re-evaluation

Date	Event
February 6, 2014	Final ESD signed
January 2015 – September 2016	Third FYR
May 2018 – November 2018	Additional Remedial Action
January 2019 – February 2020	Post Additional Remedial Action Groundwater Sampling

8.1.4 History of Contamination

The OWS was removed in March 1994 and the influent and effluent piping were sealed at the excavation boundaries. Soil was excavated to a depth of about 6.5 ft and was transported off site for treatment and disposal. TRPH and PAHs were detected in soil borings at this location. Groundwater sampling did not detect any exceedances over target levels. During groundwater investigative actions conducted in 1994 and 1996, TCE and PCE were detected in the localized area around the former OWS.

In January 1994, the 2,000-gallon UST was removed. There was no evidence of petroleum-stained soils or visible Light Non-Aqueous Phase Liquids on the groundwater in the excavation; however, a slight sheen was noted on the water surface in the excavation. Screening of the excavations sidewalls for organic vapors indicated potentially elevated concentrations of petroleum hydrocarbons in the northwest portion of the excavation. Subsequent soil borings indicated the presence of TRPH and lead. Samples from installed monitoring wells indicated the presence of chlorobenzene, 1,4-dichlorobenzene, benzene, and naphthalenes.

8.1.5 Initial Response and Basis for Action

A RI/BRA was conducted at Site OT026/OU-29 in 1997 which included surface and subsurface soil, and groundwater sampling. PAH concentrations were detected above FDEP Commercial/Industrial SCTLs in surface soil near Building 760 (Woodward-Clyde, 1997). Results for subsurface soil samples were all below FDEP Commercial/Industrial SCTLs and results for groundwater samples within the area of the former OWS location showed chlorinated VOC concentrations above Federal MCLs and FDEP GCTLs. Based on this data, a BRA was completed which assessed human receptors under a commercial/industrial land-use scenario and potential ecological receptors. Results of the RI/BRA indicated that there were no unacceptable risks to human health or ecological receptors at the site. Although no potential unacceptable human health or ecological risks were identified, several PAHs were detected in surface soil samples at concentrations above the FDEP Commercial/Industrial SCTLs derived from 1×10^{-6} excess cancer risk.

8.2 OT026/OU-29 RECORD OF DECISION

The Site OT026/OU-29 ROD was finalized in October 1998 and signed in March 1999. The remedy for soil was completed with residual soil contamination for PAHs present above the residential SCTLs (Montgomery Watson, 1998).

An ESD was signed by the USEPA on February 6, 2014 (AFCEC, 2013). The purpose of the ESD was to formally document the inclusion of LUCs as part of the remedy for Site OT026/OU-29 (AFCEC, 2013). The Site OT026/OU-29 LUCs objectives are to:

- Prevent residential use, including use of the property for hospitals for human care, public or private school for persons under 18 years of age, or daycare centers for children.

- Prevent exposure to the subsurface soils, by preventing digging, excavating, or conducting any other activity that would disturb the surface cover without coordinating such efforts and obtaining approval from the FDEP, USEPA, and the Air Force, or their successors.

- Prevent exposure to the groundwater, by prohibiting the consuming, causing exposure to, or otherwise using the groundwater for any purpose whatever, without coordinating such efforts and obtaining approval from the FDEP, USEPA, and the Air Force, or their successors.

- Prevent actions that disturb, move, damage, mar, tamper with, interfere with, obstruct, or impede any wells and treatment facilities and systems, and related piping used in the environmental remediation and restoration on the property.

8.2.1 Remedy Selection

The RAOs specified for Site OT026/OU-29 in the 1998 ROD are to:

- Prevent human and ecological exposure to surface soils at OU-29 that contain PAHs at concentrations above the FDEP industrial soil cleanup goals listed in the 1999 ROD, including: B(a)P (1.5 mg/kg).

- Prevent human exposure to groundwater that contains arsenic at concentrations above the FDEP and federal MCL of 10 µg/L.

The remedies selected for this site as identified in the ROD are as follows.

Soil: Removal of contaminated soil exceeding industrial SCTLs for disposal in a solid waste (RCRA Subtitle D) landfill.

8.3 REMEDY IMPLEMENTATION

8.3.1 1999 Soil Removal

In May and September 1999, the USAF completed a RA at Site OT026/OU-29. Approximately 1,350 tons of contaminated soil/limestone were removed from four areas to a depth of 2 ft bgs and transported off site for disposal. Confirmatory soil sampling confirmed PAHs, including B(a)P, were still present in soils at concentrations above their applicable RGs. The B(a)P concentrations above the RG of 1.5 mg/kg ranged from 1.7 mg/kg to 5.4 mg/kg (OHM, 2000).

8.3.2 Land Use Controls

Annual deed restriction inspections were completed from 2008 until the ESD was signed in 2014. The purpose of the ESD was to formally implement LUCs as part of the selected remedy and since 2014, annual LUC site inspections have been performed at the site to ensure that the LUCs continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

8.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site OT026/OU-29 in order to determine the extent and concentrations of the remaining COCs in the soil. The SI/Re-evaluation included soil sampling at 56 soil borings and groundwater sampling at two monitoring wells (URS/FPM, 2013).

The soil samples were analyzed for arsenic by SW-846 Method 6010C, PAHs by SW-846 Method 8270D, metals by SW-846 Method 6010C, and Heptachlor Epoxide by SW-846 Method 8081B. Results showed arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg at one location and calculated B(a)P concentrations above the FDEP Residential SCTL of 0.1 mg/kg at five locations. No other analytes were detected at concentrations above FDEP Commercial/Industrial SCTLs. The groundwater sample was analyzed for arsenic by SW-846 Method 6010C. Analytical results indicated an elevated arsenic concentration of 49 µg/L, above the Federal MCL and FDEP GCTL of 10 µg/L. Groundwater samples were analyzed for arsenic by SW-846 Method 6010C and VOCs by SW-846 Method 8270D. Analytical results indicated exceedances of PCE (5.8 µg/L), TCE (13.1 µg/L), and VC (1.6 µg/L) above the respective Federal MCLs and FDEP GCTLs at OU29-MW02 (URS/FPM, 2013). No other analytes were detected at concentrations above Federal MCLs and FDEP GCTLs. Details for the 2013 SI/Re-evaluation can be found in the Final Site Investigation Report, dated September 2013 (URS/FPM, 2013).

8.5 PROGRESS SINCE THE LAST REVIEW

The third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the Third FYR, "based on the completed RA, the remedy at Site OT026/OU-29 is protective of human health and the environment in the short term based on the LUCs that are in place. The remedy will be protective in the long-term once the areas of additional arsenic and B(a)P contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing an additional remedial action". As a result, the third FYR recommended that an Additional RA for removing soils above the FDEP Commercial/Industrial SCTLs for industrial land use be conducted for long-term protectiveness of the remedy selected in the ROD. The Additional RA was completed in 2018 and 2019 per this recommendation and is discussed below. This section also includes the descriptions and results of additional activities completed since the third FYR, including post soil removal groundwater monitoring.

8.5.1 Additional Remedial Action – Soil

An Additional RA was initiated at Site OT026/OU-29 in May 2018 that included excavating impacted soils at five areas originally identified during the 2013 SI/Re-evaluation, and at three areas identified during confirmatory sampling as part of the 2013 SI-Re-evaluation. These areas are identified as Excavation Areas 1 through 5, S-3, S-22, and S-25 and are illustrated in **Figure 13**. Approximately 1,026 tons of arsenic and B(a)P contaminated soil were removed. The excavation depths ranged from 2 ft bgs to 4 ft bgs (URS/FPM, 2020e). Based on the confirmatory soil sampling results, the soil that was previously found to contain arsenic concentrations exceeding the FDEP Commercial/Industrial SCTL of 12 mg/kg was removed to 4 ft bgs, approximately 6-inches above the groundwater table. Confirmatory soil sampling results confirmed that B(a)P in soils was also removed to the FDEP Commercial/Industrial SCTL of 0.7 mg/kg within 6-inches of the groundwater table at all excavation areas except for one wall sample at Excavation Area 4 (URS/FPM, 2020e). Over-excavation of the wall sample location was not possible as the remaining contaminated locations are adjacent to a storm water drainage ditch. Over-excavation was not conducted for the bottom sample as the sampling depth (4 ft bgs) is in the vicinity of the groundwater table (URS/FPM, 2020e). The field constraint boundary is illustrated in **Figure 12**.

8.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil. Monitoring well OU29-MW01R was sampled on March 15, 2019, June 19, 2019, and on February 18, 2020. Monitoring wells OU29-MW02R and OU29-MW03 were sampled on January 29, 2019, April 29, 2019, and on February 18, 2020. The monitoring well locations are illustrated in **Figure 13**. Samples were analyzed for metals by SW-846 Method 6010C, PAHs by SW846 Method 8270D, and VOCs by SW846 Method 8260B. The analytical results at OU29-MW01R and OU29-MW03 indicated metals, PAHs, and VOC concentrations below their respective Federal MCLs and FDEP GCTLs during all three sampling events (URS/FPM, 2021d). The analytical results at OU29-MW02R from the January 29, 2019 sampling event indicated metals and PAHs below their respective Federal MCLs and FDEP GCTLs. However, results indicated exceedances of the Federal MCLs and FDEP GCTLs for PCE (11.4 µg/L) and VC (1.2 µg/L). The following sampling events conducted on April 29, 2019, and February 18, 2020, indicated metals, PAHs, and VOC concentrations below their respective Federal MCLs and FDEP GCTLs. While VOCs were below Federal MCLs and FDEP GCTLs at OU29-MW02R for the final two monitoring rounds, it was recommended in the post soil removal groundwater monitoring report that monitoring be conducted at this monitoring well for VOCs by SW846 Method 8260C in association with the Former Homestead FYRs to confirm these low-level VOC concentrations (URS/FPM, 2021d).

8.5.3 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site OT026/OU-29 ESD. Site OT026/OU-29 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the annual inspections and interviews indicated that the site

is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11E Deed EURCs, and that the property owner is aware of the LUC mandatory compliance. In addition, the Additional RA field constraint, identified in the 2018/2019 Additional RA, was also inspected during the 2020 inspection event in accordance with the *Former Homestead AFB Long-Term Management Work Plan*, provided in **Appendix A**. This constraint is also provided in **Table 1**. The inspection indicated that it is still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

8.6 FIVE-YEAR REVIEW PROCESS

8.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site OT026/OU-29. Relevant documents/data sources include, but are not limited to the Visual Inspection, the RI/BRA, the IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the 1998 Final ROD for Site OT026/OU-29, signed March 1999, the 2013 ESD signed February 2014, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2020 Additional Remedial Action Completion Report – Soil, the 2020 Additional Remedial Action Completion Report – Soil, and the 2020 Long-Term Management Report (2020 LUC site inspection) dated 2021.

8.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ESD. No unusual observations or breaches/failures of the remedy were documented during this visit. In addition, the Additional RA field constraint was inspected, and it is still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

An interview with a representative of the property owner~~/occupants~~ was also completed through email. The representative is aware of the LUC mandatory compliance and the boundaries of the Additional RA field constraint. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

8.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, the remedy for Site OT026/OU-29 is functioning as intended. The 1999 ROD specifies NFA for soil, as residual contamination remains above UU/UE levels. The property transfer deed contains LUCs in the form of EURCs. The 2013 ESD was signed on February 6, 2014 making the LUCs part of the ROD. Based on the Additional RA completed in 2018 and 2019, soil containing arsenic and PAHs (including B(a)P), in concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site with the exception of one area. This area contained one

sample with a B(a)P concentration above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg. Over-excavation was not conducted in this area due to a field constraint, such as the presence of a storm water drainage ditch (URS/FPM, 2020e). The boundary of the field constraint has been added to the OT026/OU-29 LUC Site Inspection program through the Former Homestead AFB Long-Term Management Work Plan and will be inspected annually (FPM, 2021c). In addition, the property owner have been notified of its boundaries through the LUC site inspection interviews. With the LUCs and inspections of the field constraint in place, there are no unacceptable risks to human health posed by soil contamination at Site OT026/OU-29 under the current industrial land use scenario. Site OT026/OU-29 is vacant/open space and the property is designated for industrial use. With the LUCs and field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site OT026/OU-29 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

No, the soil RGs of 10 mg/kg for arsenic and 1.5 mg/kg for PAHs, captured in the 1998 ROD, have since been rejected by the USEPA for the lack of supporting documentation regarding how the values were derived. As a result, soil RGs for arsenic and PAHs (including B(a)P) are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP Residential SCTL for B(a)P is 0.1 mg/kg and the FDEP Commercial/Industrial SCTL for B(a)P is 0.7 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No, the Additional RA completed in 2018, removed previously identified soil with B(a)P concentrations above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg except for one area. However, exposure to the residual soil contamination above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg for B(a)P is restricted by the presence of a storm water drainage ditch (**Figure 12**). The boundary of the field constraint has also been added to the Site OT026/OU-29 LUC Site Inspection Program and will be inspected annually.

In addition, while VOC concentrations above Federal MCLs and FDEP GCTLs were observed in the January 2019 post soil removal action groundwater event, the property is subject to groundwater use restrictions implemented in the 2013 ESD. These restrictions prevent exposure to the impacted groundwater.

8.8 ISSUES

No issues were identified in this review for Site OT026/OU-29.

8.9 RECOMMENDATIONS

In addition, arsenic and B(a)P concentrations in soil at Site OT026/OU-29 are above the FDEP Residential SCTL of 2.1 mg/kg and 0.1 mg/kg, respectively. Therefore, continuation of annual LUC site inspections and FYRs are recommended. One area within the site also contains B(a)P concentrations in soil above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg. However, exposure to the residual soil contamination above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg is restricted by the Additional RA field constraint. While the constraint restricts exposure to the residual soil contamination, it is located within property designated for future re-development and could potentially be removed. Therefore, verification that this constraint still exists is to be conducted during the annual LUC site inspections. The field constraint boundaries and inclusion of its inspection in the annual LUC Site Inspection Program have been implemented at the site through the Former Homestead AFB Long-Term Management Work Plan (FPM, 2021c).

It is also recommended that OU29-MW02R be sampled for VOCs by SW846 Method 8260C in association with the Former Homestead FYRs to confirm these low-level VOC concentrations per the recommendation of the OT026/OU-29 (URS/FPM, 2021d). While VOCs were below Federal MCLs and FDEP GCTLs at OU29-MW02R for the final two monitoring rounds (April 2019 and February 2020), VOC concentrations above Federal MCLs and FDEP GCTLs were detected during the January 2019 sampling event.

8.10 PROTECTIVENESS STATEMENT

The remedy at Site OT026/OU-29 is protective of human health and the environment.

8.11 NEXT REVIEW

Site OT026/OU-29 will be subject to the next FYR. The next FYR is due January 12, 2026.

9.0 SITE SS040/OU-30

9.1 BACKGROUND

9.1.1 Physical Characteristics

Site SS040/OU-30 includes the New Contractor Storage Area Parking Lot located in the east portion of the former base (**Figure 14**), south of the intersection of Bikini Boulevard and Pilsen Road in Parcel 11E. Site SS040/OU-30 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County, and encompasses an area of approximately 2.55 acres. The site is located in an unpopulated area with no active businesses or residences nearby. Only workers may access the site periodically.

In December 2012, a T&ES Survey of areas in and around the vicinity of SS040/OU-30 was conducted. During this survey, clusters and individual populations of Small's milkpea *(Galactia smallii)* were noted in one small area on the west side of SS040/OU-30. This plant species is protected under the Endangered Species Act of 1973. However, the occurrences were not observed

in an updated T&ES Species surveys conducted on September 26 and 27, 2017 or on March 13, 2018. In addition, no occurrences of any other protected flora or fauna were noted at SS040/OU-30 in any of the events as well (URS/FPM, 2021e). The locations of the Small's milkpea *(Galactia smallii),* identified in December 2012, are illustrated in **Figure 14**.

9.1.2 Land and Resource Use

The 315 ft by 135 ft asphalt parking area in the vicinity of Building 767 was used by private demolition and debris hauling contractors for storage at the time of the confirmation sampling in 1994. Steel 55-gallon drums containing fuel oil and hydraulic fluid, ASTs, construction machinery, mobile fuel tanks, scrap metal, and other miscellaneous debris were observed in the parking lot during a June 1993 visual inspection. During the 1996 SI activities, the parking lot was being used by another contractor for a decontamination water treatment facility. Several large, lined, aboveground holding tanks and an air stripping tower were observed to be present at the site. The entire parking area is bordered by grass and drains to the northeast and southwest towards the drainage swales. The drainage swales are located approximately 10 ft east and west of the parking areas, and a canal is located approximately 80 ft north of the area. Building 767, which was located 50 ft south of the lot, has been removed. Building 769 is located 50 ft northwest of the parking lot.

The salvaged debris and one AST that were located on the western half of the parking area had been removed. It was reported that the AST previously located at the southwest corner appeared to have been leaking. Another AST (approximately 2,000-gallon capacity) that may have contained diesel fuel was located along the east edge of the lot at the time of the visual inspection but was removed before the beginning of the confirmation sampling program. It was surrounded by a coarse limestone berm approximately 1 ft high. During the 1993 visual inspection, dead vegetation and black, stained soils were observed in the southwest and northwest corners of the lot, and dead vegetation was also observed on the east side of the parking lot (MWH, 2006).

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

There is no surface water present at Site SS040/OU-30. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. Groundwater beneath the site has not been used for drinking water purposes and there are no plans to do so.

9.1.3 Site Chronology

A list of important Site SS034/OU-30 historical events and relevant dates in the site chronology is shown below. The identified events are not comprehensive.

Date	Event
1993	Visual Inspection
1994	Confirmation Sampling
1996-1997	Expanded SI

Date	Event
1997-1998	RI/BRA
1999	FS
1999	Proposed Plan
February–July 2001	IRA in Support of Proposed ROD
December 2001	IRAs in Support of Proposed ROD Report
April 2003	2003 Annual Groundwater Sampling
May 2003	First FYR
April 2004	2004 Annual Groundwater Sampling
April 2006	2006 Biennial Groundwater Monitoring
June 8, 2006	Final ROD Signed
April 2008	2008 Biennial Groundwater Monitoring
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
February 2010	2010 Biennial Groundwater Monitoring
2013	Site Investigation/Re-evaluation
March 2013	2012 Biennial Groundwater Monitoring
October 2014	2014 Biennial Groundwater Monitoring
January 2015 – September 2016	Third FYR
October 2016	2016 Biennial Groundwater Monitoring
May 2018 – March 2019	Additional Remedial Action
October 2018	2018 Biennial Groundwater Monitoring
October 2018 – June 2019	Post Additional Remedial Action Groundwater Sampling
March 2020 – September 2020	Groundwater Treatment Pilot Study
December 2020	2020 Biennial Groundwater Monitoring

9.1.4 History of Contamination

Preliminary investigations at Site SS040/OU-30 were completed as part of the confirmation sampling program in 1994. Soil results indicated B(a)P and arsenic concentrations exceeding background concentrations. Groundwater samples collected exhibited arsenic concentrations exceeding the previous FDEP GCTL of 50 µg/L.

9.1.5 Initial Response and Basis for Action

In October 1994, an UST was excavated and removed. The UST was located immediately northeast of Building 769 next to an unnumbered building. Field screening concentrations for soils were reported to be below 10 ppm; however, a film of petroleum product was noted on the groundwater surface in the UST excavation. A temporary monitoring well was installed after the excavation was backfilled. Sampling did not indicate any exceedances. An AST was subsequently installed in the same location.

A 750-gallon diesel fuel UST was also located along the northern edge of the site and was removed in January 1994. Field screening for soil vapors indicated that all concentrations were below l0 ppm. No petroleum sheen or product was observed on the groundwater surface in the excavation.

The product distribution lines were capped at the excavation boundary, and the excavation was backfilled with clean fill material. A monitoring well was installed and sampled. No analytes were reported above their respective practical quantitation limits.

As a result of the confirmation sampling, an expanded SI was completed in February 1996. Sampling analysis indicated the presence of PAHs, low-level VOCs, and seven metals above background in surface soils. Arsenic was detected in subsurface soil samples and groundwater samples. Results of the expanded SI indicated that PAHs and arsenic were present in the surface and subsurface soils on the site. Arsenic was also present in groundwater samples. Based on these findings, it was recommended that an RI be conducted at Site SS040/OU-30.

The RI/BRA found that arsenic in the groundwater posed an unacceptable risk to human health. Arsenic contamination in groundwater was found to be limited to two main areas: 1) the eastern edge of the site along Pilsen Road, centered at monitoring well OU30-AOC1-MW02, and 2) the southwestern corner of the site, in the vicinity of monitoring well OU30-SM10-MW01. It was also determined that arsenic and some individual PAHs exceeded their respective industrial SCTLs at the northeast corner of the site parking lot.

9.2 SS040/OU-30 RECORD OF DECISION

A ROD was signed by USEPA for Site SS040/OU-30 on June 8, 2006. The selected remedy included soil removal, groundwater monitoring, and LUCs (MWH, 2006). The Site SS040/OU-30 LUCs objectives are to:

- Prevent human exposure to soil contaminated with arsenic and PAHs above the FDEP Residential SCTLs.
- Prevent direct human exposure to groundwater contaminated with arsenic above the Federal MCL and FDEP GCTLs.
- Protect the integrity of the groundwater monitoring wells until such time as groundwater monitoring, as a means of compliance with LUCs are satisfied or monitoring during the FYR is no longer required.

9.2.1 Remedy Selection

RAOs were proposed for Site SS040/OU-30 for use during the development of remedial alternatives. These RAOs stress protection of human health and the environment and are detailed in the ROD, signed on June 8, 2006. The RAOs that were developed are as follows:

- Prevent human exposure to soils that contain arsenic at concentrations above the RG of 10 mg/kg.
- Prevent human exposure to soils that contain PAHs at concentrations above the alternate SCTL (B(a)P) or FDEP Commercial/Industrial SCTLs.

- Prevent human exposure to groundwater that contains arsenic at concentrations above the Federal MCL and FDEP GCTL of 10 µg/L.

The remedies selected for this site as identified in the ROD are as follows.

Soil: Removal of soils containing arsenic at levels above the alternate industrial SCTL/RG (10 mg/kg) and soils containing PAH at levels above 1.5 mg/kg for disposal in a solid waste (RCRA Subtitle D) landfill and implementation of LUCs associated with residual soil contamination.

Groundwater: Long-term groundwater monitoring of the arsenic concentrations to document and quantify the concentrations of arsenic and associated risk to human health and the environment and implementation of LUCs. Additional groundwater treatment was also proposed through in situ adsorption, but it was not implemented.

9.3 REMEDY IMPLEMENTATION

9.3.1 2001 Soil Removal

Soil removal activities were completed at Site SS040/OU-30 in 2001 as an IRA. Approximately 2,800 tons of contaminated soil were removed to a depth of 2 ft bgs. Confirmatory soil sample results indicated arsenic and PAH impacted soil remained above the RGs at the site (IT Corporation, 2002). The impacted soil was not removed as it was located at 2 ft bgs, below the exposure pathway, or bordered by asphalt. For sidewalls bordering asphalt, the paved surface acts as a cap to prevent rainwater from infiltrating to the soil as well as prevent direct exposure to contaminated soil.

9.3.2 Groundwater Monitoring

Following completion of the IRA at Site SS040/OU-30, the USAF initiated semiannual long-term groundwater monitoring in October 2001. In 2004, the sampling frequency was revised to biennial and has been completed through 2020. As groundwater monitoring is ongoing and the latest event was completed in December 2020, the results from the most recent monitoring event and historical data comparison are provided in the ***Progress Since the Last Review*** section to provide chronological descriptions of tasks completed since the last FYR.

9.3.3 Land Use Controls

Deed restrictions, implemented in the form of land use restrictions, were formally implemented as LUCs in the Site SS040/OU-30 ROD. Per the requirements from USEPA in their 3 July 2008 letter (**Appendix A**), annual LUC inspections have also been performed at the site since 2008 to ensure that the LUCs continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

9.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site SS040/OU-30 to determine the extent and concentrations of the remaining arsenic and B(a)P contamination in the soil. The SI/Re-evaluation included soil sampling at 69 boring locations and groundwater sampling at 11 monitoring wells for arsenic and PAH analysis. Soil sampling results indicated arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg from seven locations and B(a)P concentrations above the FDEP Residential SCTL of 0.1 mg/kg from 14 locations from 0 to 4 ft bgs. In addition, groundwater sampling results indicated arsenic concentrations above the Federal MCL and FDEP GCTL were present in samples collected from four monitoring wells. Arsenic exceedances ranged from 31 µg/L to 467 µg/L. Details for the 2013 SI/Re-evaluation can be found in the Final Site Investigation Report, dated September 2013 (URS/FPM, 2013).

9.5 PROGRESS SINCE THE LAST REVIEW

The Third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the Third FYR, "the selected remedy at Site SS040/OU-30 is protective of human health and the environment in the short term and will be protective in the long-term once the areas of additional arsenic and B(a)P contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing an Additional RA. Exposure pathways that could result in unacceptable risks are being controlled in the short-term". As a result, the Third FYR recommended that an Additional RA for removing soils above the FDEP Commercial/Industrial SCTLs for industrial land use be conducted for long-term protectiveness of the remedy selected in the ROD. The Additional RA was completed in 2018 per this recommendation and is discussed below. This section also includes the descriptions and results of additional activities completed since the Third FYR, including the post soil removal groundwater monitoring, groundwater treatment pilot study, and the ongoing long-term groundwater monitoring, which is conducted in accordance with the ROD.

9.5.1 Additional Remedial Action - Soil

An Additional RA was initiated in April 2018 by excavating the impacted soil at Site SS040/OU-30 containing arsenic concentrations greater than the FDEP Commercial/Industrial SCTL of 12 mg/kg, and B(a)P concentrations greater than the FDEP Residential SCTL of 0.1 mg/kg, as identified in the 2013 SI/Re-evaluation. Approximately 2,021 tons of contaminated soil were removed from 13 excavation areas to 2 ft bgs and 4 ft bgs (URS/FPM, 2021e). These areas are identified as Excavation Areas 1 through 11, S21, and S29 and are illustrated in **Figure 15**. Confirmatory soil sampling results indicated that B(a)P and arsenic concentrations were below the FDEP Commercial/Industrial SCTL for arsenic of 12 mg/kg or the FDEP Commercial/Industrial SCTL for B(a)P of 0.7 mg/kg at seven excavation areas. Arsenic and B(a)P remain above their respective FDEP Commercial/Industrial SCTLs at Excavation Areas 2, 4, 5, and 9. Over-excavation was not conducted at the remaining areas due to field constraints, including a sewer lift station and stormwater drainage culvert/ditches (URS/FPM, 2021e). The field constraint boundaries are illustrated in **Figure 14**.

9.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil. Monitoring well OU30-SM10-MW01R was sampled in October 2018 and June 2019, OU30-AOC1-MW02R was sampled in December 2018, OU30-AOC1-MW04 was sampled in October 2018, December 2018, March 2019, and June 2019, OU30-MW06R was sampled in December 2018, March 2019, and June 2019, OU30-MW07 was sampled in October 2018, OU30-MW08R was sampled in December 2018, OU30-MW09R was sampled in October 2018, and OU30-MW16 was sampled in December 2018, March 2019, and June 2019. These monitoring wells are illustrated in **Figure 15**. Monitoring wells OU30-SM10-MW01R, OU30-AOC1-MW02R, OU30-AOC1-MW04, OU30-MW06R, OU30-MW07, OU30-MW08R, OU30-MW09R, and OU30-MW16 were sampled for arsenic analysis by SW-846 Method 6010C. Samples from OU30-SM10-MW01R, OU30-AOC1-MW04, OU30-MW06R, and OU30-MW16 were also analyzed PAHs by SW-846 Method SW8270D. Post soil removal groundwater monitoring results are included in **Table 5**. B(a)P was not detected in any of the samples collected from OU30-SM10-MW01R, OU30-AOC1-MW04, OU30-MW06R, and OU30-MW16. Analytical results indicated arsenic concentrations exceeded the Federal MCL and FDEP GCTL in samples collected from monitoring wells OU30-MW09 at 24.2 µg/L in October 2018 and OU30-AOC1-MW02R at a concentration of 66 µg/L in December 2018 (FPM, 2020). Arsenic concentrations were below the Federal MCL and FDEP GCTL in samples collected from the remaining monitoring wells sampled during each of the monitoring events (FPM, 2020).

9.5.3 Groundwater Treatment Pilot Study

A groundwater treatment pilot study was completed to evaluate the groundwater treatment approach and to determine the effectiveness in remediating arsenic impacted groundwater at the sites. This pilot study included the application of Metafix® reagent by soil mixing in the saturated zone to create a permeable treatment area to remove dissolved arsenic from the groundwater by reductive precipitation and adsorption.

Baseline groundwater sampling was completed in March 2020 and July 2020 at monitoring wells OU30-AOC1-MW02R, OU30-MW06R, and OU30-MW09R. During the March event, the sample was analyzed for arsenic, calcium, cobalt, manganese, magnesium, and iron by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. The July 2020 sampling event was completed as part of baseline sampling to obtain results for antimony, cadmium, lead, nickel, and thallium by SW-846 Method 6010C and fluoride by SW-846 Method 9056 as well. Groundwater laboratory analytical data indicates that arsenic exceeded the respective Federal MCL and FDEP GCTL of 10 µg/L in the samples collected from two monitoring wells OU30-AOC1-MW02R (31.0 µg/L) and OU30-MW09R (12.8 µg/L). All other detected analyte concentrations were below their respective Federal MCLs and FDEP GCTLs.

Approximately 3,700 lbs of Metafix® reagent was evenly applied to two excavations within the saturated zone and mixed within soils utilizing heavy equipment. The soil mixing occurred on July 25, 2020. Details of the soil mixing activities are included in the Groundwater Treatment

Pilot Study Report (FPM, 2021a). The groundwater treatment excavation locations are illustrated in **Figure 15**.

A post-remediation sampling event was completed between September 8 and 10, 2020 to determine the effectiveness of the pilot study in accordance with the Groundwater Treatment Pilot Study Work Plan (FPM, 2020). Samples collected from monitoring wells OU30-AOC1-MW02R, OU30-MW06R, and OU30-MW09R were analyzed for arsenic, antimony, cadmium, calcium, cobalt, iron, lead, manganese, magnesium, nickel, and thallium by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride, fluoride, and nitrate by Method 9056 and alkalinity by SW-846 Method 2320B. Arsenic was detected in September 2020 at OU30-AOC1-MW02R, OU30-MW06R, and OU30-MW09R above the Federal MCL and FDEP GCTL of 10 µg/L at 12.4 µg/L, 310 µg/L, and 23.2 µg/L, respectively. The September 2020 arsenic concentration at OU30-AOC1-MW02R was lower than for the March 2020 event, when it was detected at 31 µg/L. September 2020 arsenic concentrations at OU30-MW06R and OU30-MW09R increased from the March 2020, when it was detected at 4.5 J µg/L and 12.8 µg/L, respectively (FPM, 2022a). All other analytes were detected below the Federal MCLs and FDEP GCTLs and indicated minimal variations between the baseline monitoring event and the post-soil mixing monitoring event results except for magnesium at OU30-AOC1-MW02R (9,350 µg/L) and OU30-MW06R (5,420 µg/L). Magnesium is likely an artifact of natural groundwater in the area, which is a calcium-magnesium-carbonate type from native limestone and is likely elevated as a result of the Metafix® reagent application (FPM, 2022a).

9.5.4 Long-Term Groundwater Monitoring

In accordance with the 2006 ROD, groundwater monitoring has been completed at Site SS034/OU-20 since 2001 and has been completed biennially since 2004. Groundwater monitoring is completed at seven monitoring wells, including OU30-SM10-MW01, OU30-AOC1-MW02, OU30-AOC1-MW04, OU30-MW06, OU30-MW07, OU30-MW08, and OU30-MW09. OU30-SM10-MW01, OU30-AOC1-MW02, OU30-MW06, OU30-MW08, and OU30-MW09 have been replaced by OU30-SM10-MW01R, OU30-AOC1-MW02R, OU30-MW06R, OU30-MW08R, and OU30-MW09R, respectively, as a result of the 2018/2019 Additional RA. There are four additional monitoring wells located at the site which are not part of the long-term groundwater monitoring program. These monitoring wells include OU30-MW10, OU30-MW11, OU30-MW12, and OU30-MW15, which have been sampled since the last FYR. OU30-MW16 was installed following the 2018/2019 Additional RA. The monitoring well locations are illustrated in **Figure 15**.

The most recent biennial groundwater sampling event was conducted in December 2020. Based on groundwater elevation data collected, groundwater elevations measured ranged between 1.10 to 1.72 ft NGVD 29. All samples collected from the monitoring wells OU30-SM10-MW01R, OU30-AOC1-MW02R, OU30-AOC1-MW04, OU30-MW06R, OU30-MW08R, and OU30-MW09R were analyzed for total arsenic using SW-846 Method 6010D. OU30-MW07 could not be sampled as roots within the monitoring well restricted access to the groundwater level. Groundwater laboratory analytical data indicates that arsenic exceeded the Federal MCL and FDEP GCTL of 10 µg/L at three monitoring wells OU30-SM10-MW01R (11.6 µg/L), OU30-AOC1-MW02R (207 µg/L) and OU30-MW09R (66 µg/L) (FPM, 2022b). Arsenic concentrations

at OU30-SM10-MW01R had not exceeded the Federal MCL and FDEP GCTL of 10 µg/L since 2008. Arsenic concentrations have consistently contained arsenic above the Federal MCL and FDEP GCTL of 10 µg/L since 2001 at monitoring wells OU30-AOC1-MW02R and OU30-MW09R. Historical arsenic concentrations in the groundwater are provided in **Table 5**. The December 2020 arsenic concentrations and plume are illustrated in **Figure 15**.

9.5.5 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site SS040/OU-30 ROD. Site SS040/OU-30 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the annual inspections and interviews indicated that the site is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11E Deed EURCs (**Table 1**), and that the property owner is aware of the LUC mandatory compliance. In addition, the Additional RA field constraints and engineering controls, identified in the 2018/2019 Additional RA, were also inspected during the 2020 inspection event in accordance with the *Former Homestead AFB Long-Term Management Work Plan*, provided in **Appendix A**. These constraints, presented in **Section 9.5.1**, are also provided in **Table 1**. The inspection indicated that they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

9.6 FIVE-YEAR REVIEW PROCESS

9.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site SS040/OU-30. Relevant documents/data sources include, but are not limited to the Visual Inspection, Confirmation Sampling Report, the 1997 RI/BRA, the 2001 IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year Review, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed; the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the Annual and Biennial Groundwater Monitoring Reports (2001 Annual Groundwater Monitoring Report through the 2018 Biennial Groundwater Monitoring Report), the 2006 Final ROD for SS040/OU-30, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2019 Additional Remedial Action Completion Report – Soil, the 2020 Groundwater Treatment Pilot Study Work Plan, the 2020 Groundwater Treatment Pilot Study Report, the 2021 Optimization Recommendations Report, and the 2020 Annual Long-Term Management Report (2020 LUC site inspections and biennial) dated 2021.

9.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ROD. No unusual observations or breaches/failures of the remedy were documented during this visit. In addition, the Additional RA field constraints, including the engineering controls, were inspected, and they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

An interview with a representative of the property owner was also completed through email. The representative is aware of the LUC mandatory compliance and the boundaries of the Additional RA field constraints, including the engineering controls. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

9.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, the remedy for Site SS040/OU-30 is functioning as intended. The ROD specifies prohibitions for excavation of soils and residential use restrictions. The remedy also includes monitoring for groundwater with restrictions for groundwater use. The arsenic and PAHs, including B(a)P remaining in soil and arsenic in groundwater does not allow for UU/UE. Based on the Additional RA completed in 2018 and 2019, soil with arsenic and B(a)P concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site except for at four areas. Over-excavation was not conducted at the remaining areas due to field constraints, including a sewer lift station and stormwater drainage culvert/ditches (URS/FPM, 2021e). An engineering control is provided and maintained by one of the field constraint locations, the sewer lift station (Generator Building and Building 769), which prevents future exposure to soil containing arsenic above the Commercial/Industrial SCTL of 12 mg/kg. The boundaries of the field constraints have been added to the SS040/OU-30 LUC Site Inspection program through the Former Homestead AFB Long-Term Management Work Plan and will inspected annually (FPM, 2021c). In addition, the property owner have been notified of these boundaries through the LUC site inspection interviews. With the LUCs and inspections of field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site SS040/OU-30 under the current industrial land use scenario. Site SS040/OU-30 is vacant/open space and the property is designated for industrial use. With the LUCs and field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site SS040/OU-30 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L are present at the site at three monitoring wells. While a groundwater treatment pilot study was completed in July 2020, arsenic concentrations in groundwater at these monitoring wells have increased. As a result, it cannot be concluded at this time that the groundwater treatment pilot study is enhancing remediation of arsenic impacted groundwater. Continued long-term groundwater monitoring will monitor the stability of the arsenic plume in accordance with the remedy selected in the ROD. The continued long-term groundwater monitoring will also monitor the effectiveness of the 2020 groundwater treatment pilot study.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Yes, the exposure assumptions, toxicity data, and RAOs used at the time of the remedy selection for groundwater are still valid. The groundwater RG is the Federal MCL and FDEP GCTL of 10 µg/L for arsenic.

No, the soil RGs of 10 mg/kg for arsenic and 1.5 mg/kg for PAHs, captured in the 1998 ROD, have since been rejected by the USEPA for the lack of supporting documentation regarding how the values were derived. As a result, soil RGs for arsenic and PAHs (including B(a)P) are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP Residential SCTL for B(a)P is 0.1 mg/kg and the FDEP Commercial/Industrial SCTL for B(a)P is 0.7 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No, the Additional RA completed in 2018 and 2019 removed previously identified soil with arsenic B(a)P concentrations above the FDEP Commercial/Industrial SCTLs except for four areas. However, exposure to the residual soil contamination above the FDEP Commercial/Industrial SCTLs is restricted by engineering controls, including a sewer lift station and Additional RA field constraints, including a stormwater drainage culvert and ditches (**Figure 14**). The boundaries of the field constraints have also been added to the Site SS040/OU-30 LUC Site Inspection Program and will be inspected annually.

9.8 ISSUES

No issues were identified in this review for Site SS040/OU-30.

9.9 RECOMMENDATIONS

Arsenic and B(a)P concentrations in soil at Site SS040/OU-30 are above the FDEP Residential SCTL of 2.1 mg/kg and 0.1 mg/kg, respectively. Therefore, continuation of annual LUC site inspections and FYRs are recommended. Four areas within the site also contain arsenic and B(a)P concentrations in soil above the FDEP Commercial/Industrial SCTL of 12 mg/kg and 0.7 mg/kg, respectively. However, exposure to the residual soil contamination above FDEP Commercial/Industrial SCTLs is restricted through Additional RA field constraints (**Figure 14**). While these constraints restrict exposure to the residual soil contamination, they are located within property designated for future re-development and could potentially be removed. Therefore, verification that these constraints still exist is to be conducted during the annual LUC site inspections. The field constraints boundaries and inclusion of their inspection in the annual LUC Site Inspection Program have been implemented at the site through the Former Homestead AFB Long-Term Management Work Plan (FPM, 2021c).

In addition, arsenic concentrations in groundwater at the site are also above the Federal MCL and FDEP GCTL of 10 µg/L; therefore, continuation of biennial groundwater monitoring is also recommended.

9.10 PROTECTIVENESS STATEMENT

The remedy at Site SS040/OU-30 is protective of human health and the environment.

9.11 NEXT REVIEW

Site SS040/OU-30 will be subject to the next FYR. The next FYR is due January 12, 2026.

10.0 SITE SS042/OU-31

10.1 BACKGROUND

10.1.1 Physical Characteristics

Site SS042/OU-31, which includes the Nondestructive Inspection Laboratory (Building 755), is located at the southern end of St. Nazaire Street near the main runway (**Figure 16**) in Parcel 11E. The building measures approximately 60 ft by 75 ft and is bounded on the north, south, and west sides by asphalt pavement and on the east side by a grassy area. Site SS042/OU-31 comprises a portion of Parcel 11E, owned and maintained by Miami-Dade County and is in an unpopulated area with no active businesses or residences nearby. Only workers may access the site periodically. There are no known environmentally sensitive areas on the site. Building 755 is currently not being utilized.

In December 2012, September 2017, and March 2018, T&ES Surveys of areas in and around the vicinity of SS042/OU-31 were conducted. No occurrences of protected flora or fauna were noted at SS042/OU-31 in any of the events (URS/FPM, 2020f).

10.1.2 Land and Resource Use

Building 755 originally was used for x-ray inspection of F-16 aircraft parts, analysis of aircraft engine oil, and dye penetrant/magnetic particle inspection of aircraft and support equipment. The building contained a garage, x-ray room and darkroom, offices, furnace room, and a mechanical room. The building sustained extensive damage during Hurricane Andrew in 1992, which destroyed portions of the roof and the garage doors. The building was repaired and is currently in use.

Projected future land use will be redevelopment for an unspecified commercial/industrial reuse by Miami-Dade County.

No surface water body is present on or adjacent to Site SS042/OU-31. The first groundwater encountered at the site is known as the Biscayne Aquifer, designated by FDEP as a Class G-II potable aquifer. Groundwater beneath the site has not been used for drinking water purposes and there are no plans to do so.

10.1.3 Site Chronology

A list of important Site SS042/OU-31 historical events and relevant dates in the site chronology is shown in the table below. The identified events are not comprehensive.

Date	Event
1993	Visual Inspection
1994	Confirmation Sampling
1996-1997	Expanded SI
1997-1998	RI/BRA
1999	FS
1999	Proposed Plan
February–July 2001	IRA in Support of Proposed ROD
December 2001	IRAs in Support of Proposed ROD Report
April 2003	2003 Annual Groundwater Sampling
May 2003	First FYR
April 2004	2004 Annual Groundwater Sampling
April 2006	2006 Biennial Groundwater Monitoring
June 8, 2006	Final ROD Signed
April 2008	2008 Biennial Groundwater Monitoring
2008 - 2020	Annual LUC Site Inspections
January – March 2010	Second FYR
February 2010	2010 Biennial Groundwater Monitoring
2013	Site Investigation/Re-evaluation
March 2013	2012 Biennial Groundwater Monitoring
October 2014	2014 Biennial Groundwater Monitoring
January 2015 – September 2016	Third FYR
October 2016	2016 Biennial Groundwater Monitoring
September 2018 – March 2019	Additional Remedial Action
October 2018	2018 Biennial Groundwater Monitoring
October 2018 – April 2019	Post Additional Remedial Action Groundwater Sampling
March 2020 – September 2020	Groundwater Treatment Pilot Study
December 2020	2020 Biennial Groundwater Monitoring

10.1.4 History of Contamination

The Waste Analysis Plan indicated that waste oil, waste dye penetrant, and waste emulsifier were collected and sent off site for disposal and recycling (URS/FPM, 2016).

During the 1993 visual inspection, a fill cap labeled “Fuel Oil” was discovered on the pavement south of the building. A concrete pad located northwest of the building may have been used to contain electrical equipment. Two areas of stressed vegetation were observed along the northeast boundary of the site during the 1993 inspection.

10.1.5 Initial Response and Basis for Action

Preliminary investigations were completed at Site SS042/OU-31 in 1994 as part of the confirmation sampling program and Base OWS/UST remediation program. Compounds detected in soil samples in excess of background concentrations included PAHs and arsenic. Groundwater analysis indicated no COCs. In 1994, a UST located at the southeast corner of Building 755 was removed. Subsequently, four monitoring wells were installed and sampled. Soil and groundwater analysis did not indicate any COCs.

In July 1996, an IRA was completed west of Building 755 at the location of a former concrete transformer pad. High levels of arsenic had been detected at this location during the confirmation sampling program. An area measuring approximately 37 ft by 27 ft by 3.25 ft deep was excavated. Soil samples were collected from the excavation sidewalls to determine whether acceptable arsenic concentrations had been reached. The east wall was not excavated to acceptable arsenic concentrations due to power line obstructions in the area. A groundwater sample collected from a monitoring well placed in the center of the excavation area indicated arsenic concentrations of 310 µg/L, exceeding the federal and FDEP MCL of 50 µg/L.

An expanded SI was conducted in 1996. PAHs and arsenic were detected in surface and subsurface soils. Arsenic was also detected in the groundwater. Based on these findings, the site was recommended for an RI. The RI/BRA for Site SS042/OU-31 was completed in 1998. As a result of this evaluation, it was determined that PAHs and arsenic found in surface and subsurface soils and arsenic found in the groundwater posed unacceptable risks to human health and the environment.

10.2 SS042/OU-31 RECORD OF DECISION

A ROD was signed by USEPA for Site SS042/OU-31 on June 8, 2006. The selected remedy included soil removal, groundwater monitoring, and LUCs (MWH, 2006). The Site SS042/OU-31 LUCs objectives are to:

- Prevent human exposure to soil contaminated with arsenic and PAHs above the FDEP Residential SCTLs.
- Prevent direct human exposure to groundwater contaminated with arsenic above the Federal MCL and FDEP GCTLs.
- Protect the integrity of the groundwater monitoring wells until such time as groundwater monitoring, as a means of compliance with LUCs are satisfied or monitoring during the FYR is no longer required.

10.2.1 Remedy Selection

RAOs were proposed for Site SS042/OU-31 for use during the development of remedial alternatives. These RAOs stress protection of human health and the environment and are detailed in the ROD, signed on June 8, 2006. The RAOs that were developed are as follows:

- Prevent human exposure to soils that contain arsenic at concentrations above RG of 10 mg/kg.
- Prevent human exposure to soils that contain PAHs at concentrations above the alternate SCTL (B(a)P at 1.5 mg/kg) or FDEP Commercial/Industrial SCTLs.
- Prevent human exposure to groundwater that contains arsenic at concentrations above the Federal MCL and FDEP GCTL of 10 µg/L.

The remedies selected for this site as identified in the ROD are as follows.

Soil: Removal of soils containing arsenic at levels above the alternate industrial SCTL/RG (10 mg/kg) for disposal in a solid waste (RCRA Subtitle D) landfill and implementation of LUCs associated with residual soil contamination.

Groundwater: Long-term groundwater monitoring of the arsenic concentrations to document and quantify the concentrations of arsenic and associated risk to human health and the environment and implementation of LUCs.

10.3 REMEDY IMPLEMENTATION

10.3.1 2001 Soil Removal

Beginning in February 2001, an IRA was conducted. Approximately 450 tons of contaminated soil/limestone were removed from two excavation areas to address B(a)P and arsenic impacted soil. All excavated soil was disposed of at a RCRA-permitted Subtitle D landfill. Clean, imported, crushed limestone material was used to complete backfilling operations (MWH, 2006). Confirmatory soil sample results from the 2001 IRA indicated arsenic and PAH impacted soil remained above the RGs at the site (IT Corporation, 2002). The impacted soil was not removed as it was located at 2 ft bgs, below the exposure pathway, or bordered by asphalt. For sidewalls bordering asphalt, the paved surface acts as a cap to prevent rainwater from infiltrating to the soil as well as prevent direct exposure to contaminated soil.

10.3.2 Groundwater Monitoring

Following completion of the IRA at Site SS042/OU-31, the USAF initiated semiannual long-term groundwater monitoring in October 2001. In 2004, the sampling frequency was revised to biennial and has been completed through 2020. As groundwater monitoring is ongoing and the latest event was completed in December 2020, the results from the most recent monitoring event and historical

data comparison are provided in the ***Progress Since the Last Review*** section to provide chronological descriptions of tasks completed since the last FYR.

10.3.3 Land Use Controls

Deed restrictions, implemented in the form of land use restrictions, were formally implemented as LUCs in the Site SS042/OU-31 ROD. Per the requirements from USEPA in their 3 July 2008 letter (**Appendix A**), annual LUC inspections have also been performed at the site since 2008 to ensure that the LUCs continue to be implemented. The confirmation of the LUC protectiveness is obtained through visual site inspections and LUC compliance interviews with the owner/occupant of the property. The results from the most recent inspection events are provided in the ***Progress Since the Last Review*** section to provide descriptions of tasks completed since the last FYR.

10.4 2013 SITE INVESTIGATION/RE-EVALUATION

In 2013, a SI/Re-evaluation was conducted for Site SS042/OU-31 to determine the extent of the remaining arsenic and B(a)P concentrations in the soil. The SI/Re-evaluation included soil sampling at 65 boring locations for arsenic and PAH analysis and groundwater sampling at six monitoring wells for arsenic analysis. Soil sampling results indicated arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg at one location and B(a)P concentrations above the FDEP Residential SCTL at seven locations from 0 to 4 ft bgs. In addition, groundwater sampling results indicated arsenic concentrations above the Federal MCL and FDEP GCTL in samples collected from monitoring wells OU31-B755-MW01, OU31-MW03, and OU31-MW04. Arsenic exceedances were 25.1 µg/L, 30 µg/L, and 36 µg/L, respectively. Details for the 2013 SI/Re-evaluation can be found in the Final Site Investigation Report, dated September 2013 (URS/FPM, 2013).

10.5 PROGRESS SINCE THE LAST REVIEW

The Third FYR report for the Former Homestead AFB was prepared in September 2016 and signed by the USEPA on September 29, 2016 (URS/FPM, 2016). Per the third FYR, "the selected remedy at Site SS042/OU-31 is protective of human health and the environment in the short-term and will be protective in the long-term once the areas of additional arsenic and B(a)P contamination above the FDEP Commercial/Industrial SCTLs are addressed by implementing Additional RA. Exposure pathways that could result in unacceptable risks are being controlled in the short-term". As a result, the Third FYR recommended that an Additional RA for removing soils above the FDEP Commercial/Industrial SCTLs for industrial land use be conducted for long-term protectiveness of the remedy selected in the ROD. The Additional RA was completed in 2018 per this recommendation and is discussed below. This section also includes the descriptions and results of additional activities completed since the Third FYR, including the post soil removal groundwater monitoring, groundwater treatment pilot study, and the ongoing long-term groundwater monitoring, which is conducted in accordance with the ROD.

10.5.1 Additional Remedial Action – Soil

An Additional RA was initiated in April 2018, by excavating the impacted soil at Site SS042/OU-31 containing arsenic concentrations greater than the FDEP Commercial/Industrial SCTL of 12 mg/kg, and B(a)P concentrations greater than the FDEP Residential SCTL of 0.1 mg/kg, as identified in the 2013 SI/Re-evaluation. Approximately 289 tons of contaminated soil were removed from six excavation areas (URS/FPM, 2020f). These areas are identified as Excavation Area 1 through 4, S-32, and S-36 and are illustrated in **Figure 17**. Confirmatory soil sampling results confirmed the removal of arsenic concentrations above the FDEP Commercial/Industrial SCTL for arsenic of 12 mg/kg at the site. Confirmatory soil sampling results also confirmed the removal of B(a)P concentrations above FDEP Commercial/Industrial SCTL of 0.7 mg/kg at the site with the except of one excavation area. B(a)P concentrations were above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg in excavation wall samples collected at Area 2. No over-excavation was completed due to the sampling locations' vicinity adjacent to a main road (URS/FPM, 2020f). The field constraint boundaries are illustrated in **Figure 16**.

10.5.2 Post Soil Removal Groundwater Monitoring

Groundwater sampling was conducted to evaluate groundwater conditions following the removal of contaminated soil. Monitoring wells OU31-B755-MW01, OU31-MW02, and OU31-MW03 were sampled for arsenic by SW-846 Method 6010C in October 2018. Samples were also collected at OU31-MW07 in October 2018, January 2019, and April 2019 and analyzed for PAHs by SW-846 Method SW8270D. The monitoring wells are illustrated in **Figure 17** and analytical results are included in **Table 6**. B(a)P was not detected in any of the samples from OU31-MW07 (FPM, 2020). Analytical results indicated arsenic concentrations exceeded the Federal MCL and FDEP GCTL of 10 µg/L in samples collected from monitoring well OU31-B755-MW01 at 42 µg/L and at monitoring well OU31-MW02 at 11.4 µg/L (FPM, 2020). Arsenic concentrations were below the Federal MCL and FDEP GCTL in the sample collected from OU31-MW03.

10.5.3 Groundwater Treatment Pilot Study

A groundwater treatment pilot study was completed to evaluate the groundwater treatment approach and to determine the effectiveness in remediating arsenic impacted groundwater at the sites. This pilot study included the application of Metafix® reagent by soil mixing in the saturated zone to create a permeable treatment area to remove dissolved arsenic from the groundwater by reductive precipitation and adsorption.

Baseline groundwater sampling was completed in March 2020 and July 2020 prior to the pilot study soil mixing activities. During the March event, the sample was analyzed for arsenic, calcium, cobalt, manganese, magnesium, and iron by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. The July 2020 sampling event was completed as part of baseline sampling to obtain results for antimony, cadmium, lead, nickel, and thallium by SW-846 Method 6010C and fluoride by SW-846 Method 9056 as well. Groundwater laboratory analytical data indicated that arsenic exceeded the respective Federal MCL and FDEP GCTL of 10 µg/L in the sample collected from monitoring well OU31-B755-MW01 (27.6 µg/L).

Additionally, the iron exceeded Federal MCL and FDEP GCTL of 300 µg/L at OU31-MW01 (325 µg/L). All other detected analyte concentrations were below their respective Federal MCLs and FDEP GCTLs.

Approximately 6,000 lbs of Metafix® reagent was evenly applied to the two excavations in the saturated zone and mixed within soils utilizing heavy equipment. The soil mixing occurred on July 24, 2020. Details of the soil mixing activities are included in the Groundwater Treatment Pilot Study Report (FPM, 2021a). The groundwater treatment excavation locations are illustrated in **Figure 17**.

A post-remediation sampling event was completed between September 8 and 10, 2020 to determine the effectiveness of the pilot study in accordance with the Groundwater Treatment Pilot Study Work Plan (FPM, 2020). Samples collected from monitoring wells OU31-B755-MW01 and OU31-MW02 were analyzed for arsenic, antimony, cadmium, calcium, cobalt, iron, lead, manganese, magnesium, nickel, and thallium by SW-846 Method 6010C, sulfate by SW-846 Method 9056A, sulfide by SW-846 Method 4500S, chloride, fluoride, and nitrate by SW-846 Method 9056 and alkalinity by SW-846 Method 2320B. Arsenic was detected at OU31-B755-MW01 above the Federal MCL and FDEP GCTL of 10 µg/L at 22.5 µg/L (FPM, 2022a). All other analytes were detected below Federal MCLs and FDEP GCTLs except for iron and magnesium. Iron and magnesium concentrations at OU31-B755-MW01 were 1,600 µg/L and 30,400 µg/L, respectively. The increase in iron is an expected attribute of the Metafix® immobilization process. Magnesium is an artifact of natural groundwater in the area, which is a calcium-magnesium-carbonate type from native limestone and is also likely elevated as a result of the Metafix® reagent application (FPM, 2022a).

10.5.4 Long-Term Groundwater Monitoring

In accordance with the 2006 ROD, groundwater monitoring has been completed at Site SS034/OU-20 since 2001 and has been completed biennially since 2004. Groundwater monitoring is completed at three monitoring wells, including OU31-B755-MW01, OU31-MW02, and OU31-MW03. OU31-MW04R was recently added to the groundwater monitoring network for the 2020 biennial event given its location adjacent to the arsenic plume (FPM, 2022b). This monitoring well replaced OU31-MW04 as a result of the 2018/2019 Additional RA. There are two additional monitoring wells (OU31-MW05 and OU31-MW06) located on site which are not part of the long-term groundwater monitoring program. Neither of these monitoring wells have been sampled since the last FYR. OU31-MW07 was installed following the 2018 and 2019 Additional RA. The monitoring wells are illustrated in **Figure 17**.

The most recent biennial groundwater sampling event was conducted in December 2020. Based on groundwater elevation data collected, the groundwater gradient is relatively insignificant and averages less than 0.02 ft per ft. The groundwater elevations measured ranged between 1.31 and 1.33 ft NGVD 29. Therefore, any contaminants present will exhibit little if any migration. All samples collected from the monitoring wells OU31-B755-MW01, OU31-MW02, and OU31-MW04R were analyzed for total arsenic using SW-846 Method 6010D. OU31-MW03 was not sampled as it could not be located. Groundwater laboratory analytical data indicated that arsenic exceeded the respective Federal MCL and FDEP GCTL of 10 µg/L at monitoring well OU31-

MW02 (21 µg/L). Monitoring results since 2016 indicate an increasing arsenic concentration trend at OU31-MW02. Arsenic concentrations were 2.8 J µg/L in 2016 and 11.4 µg/L in 2018. The J data qualifier associated with the OU31-B755-MW01 sample indicates that the value is an estimate. Arsenic concentrations were below the Federal MCL and FDEP GCTL of 10 µg/L at the remaining monitoring wells. However, it should be noted that while arsenic was detected at 2.1 J µg/L in monitoring well OU31-B755-MW01, arsenic concentrations have consistently been detected above the Federal MCL and FDEP GCTL of 10 µg/L at this monitoring well prior to the 2020 biennial monitoring event with concentrations ranging from 17.2 µg/L (2008) to 155 µg/L (2001) (FPM, 2022b). Historical arsenic concentrations in the groundwater are provided in **Table 6**. The December 2020 arsenic concentrations and plume are illustrated in **Figure 17**.

10.5.5 Annual LUC Site Inspections

Visual LUC site inspections and LUC compliance interviews with the owner of the property were completed in 2016, 2017, 2018, 2019, and 2020 in accordance with the Site SS042/OU-31 ROD. Site SS042/OU-31 LUCs are included in the Former Homestead LUC Summary Table included in this FYR as **Table 1**. Results from the annual inspections and interviews indicated that the site is in compliance with the implemented LUCs, that there have been no land-use changes that would impact the Parcel 11E Deed EURCs, and that the property owner is aware of the LUC mandatory compliance. In addition, the Additional RA engineering control, identified in the 2018/2019 Additional RA, was also inspected during the 2020 inspection event in accordance with the *Former Homestead AFB Long-Term Management Work Plan*, provided in **Appendix A**. This constraint is also provided in **Table 1**. The inspection indicated that they are still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

10.6 FIVE-YEAR REVIEW PROCESS

10.6.1 Document and Data Review

This FYR includes a review of all relevant documents and data sources for Site SS042/OU-31. Relevant documents/data sources include, but are not limited to the Visual Inspection, the Confirmation Sampling Report, the 1997 RI/BRA, the 2001 IRA Report, the 2003 First Five-Year Review, the 2011 Second Five-Year Review, the 2016 Third Five-Year Review, the 2006 Parcel 11E Deed, the USEPA Comprehensive Five-Year Review Guidance, FDEP Chapter 62-777, FAC, the Annual and Biennial Groundwater Monitoring Reports (2001 Annual Groundwater Monitoring Report through the 2018 Biennial Groundwater Monitoring Report), the 2006 Final ROD for SS042/OU-31, the Annual LUC Site Inspection Reports from 2008 through 2019, the 2013 Site Investigation/Re-Evaluation Report, the 2019 Additional Remedial Action Completion Report – Soil, the 2020 Groundwater Treatment Pilot Study Work Plan, the 2020 Groundwater Treatment Pilot Study Report, the 2021 Optimization Recommendations Report, and the 2020 Annual Long-Term Management Report (2020 LUC site inspections and biennial) dated 2021.

10.6.2 Site Inspection

A visual site inspection was completed on December 7, 2020 for this FYR and as part of the annual LUC compliance monitoring completed in accordance with the ROD. No unusual observations or breaches/failures of the remedy were documented during this visit. In addition, the engineering control was inspected, and it is still intact and there is no evidence of damage or disturbance that would create a potential for exposure to the underlying contamination.

An interview with a representative of the property owner was also completed through email. The representative is aware of the LUC mandatory compliance and the boundaries of the engineering control. The inspection form, including site photographs and the interview results, is provided in **Appendix B**.

10.7 TECHNICAL ASSESSMENT

Question A: *Is the remedy functioning as intended by the decision documents?*

Yes, the remedy for Site SS042/OU-31 is functioning as intended. The ROD specifies prohibitions for excavation of soils and residential use restrictions. The remedy also includes monitoring for groundwater with restrictions for groundwater use. The arsenic and PAHs, including B(a)P remaining in soil and arsenic in groundwater does not allow for UU/UE. Based on the Additional RA completed in 2018 and 2019, soil with arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg have been removed from the site. In addition, PAHs, including B(a)P, concentrations above the FDEP Commercial/Industrial SCTLs have been removed from the site except for at one area. Over-excavation was not conducted at the remaining area due to a field constraint, an active roadway (URS/FPM, 2020f). However, the active roadway acts as an engineering control limiting soil intrusive activities, and thereby restricts access and direct contact with contaminated soils. The boundary of the field constraint has been added to the SS042/OU-31 LUC Site Inspection program through the Former Homestead AFB Long-Term Management Work Plan and will inspected annually (FPM, 2021c). In addition, the property owner have been notified of its boundaries through the LUC site inspection interviews. With the LUCs and inspections of the field constraint in place, there are no unacceptable risks to human health posed by soil contamination at Site SS042/OU-31 under the current industrial land use scenario. Site SS042/OU-31 is vacant/open space and the property is designated for industrial use. With the LUCs and field constraints in place, there are no unacceptable risks to human health posed by soil contamination at Site SS042/OU-31 under the current industrial land use scenario. In addition, the EURCs included in the Parcel 11E Deed provide sufficient LUC language.

Arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L are present at the site at one monitoring well (OU31-MW02). This monitoring well has not historically contained arsenic concentrations above the Federal MCL and FDEP GCTL. Monitoring well OU31-B755-MW01 historically contained Arsenic concentrations above the Federal MCL and FDEP GCTL of 10 µg/L which have decreased over time to concentrations below the Federal MCL and FDEP GCTL. A groundwater treatment pilot study was completed in July 2020 and while it may have contributed to the decrease in arsenic at OU31-B755-MW01, arsenic concentrations increased at OU31-MW02 which is downgradient of OU31-B755-MW01. Therefore, it cannot be concluded

at this time that the groundwater treatment pilot study is enhancing remediation of arsenic impacted groundwater or if the arsenic plume is migrating. Continued long-term groundwater monitoring will monitor the migration and/or degradation of the arsenic plume in accordance with the remedy selected in the ROD. The continued long-term groundwater monitoring will also monitor the effectiveness of the 2020 groundwater treatment pilot study.

Question B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

Yes, the exposure assumptions, toxicity data, and RAOs used at the time of the remedy selection for groundwater are still valid. The groundwater RG is the Federal MCL and FDEP GCTL of 10 µg/L for arsenic.

No, the soil RGs of 10 mg/kg for arsenic and 1.5 mg/kg for PAHs, captured in the 1998 ROD, have since been rejected by the USEPA for the lack of supporting documentation regarding how the values were derived. As a result, soil RGs for arsenic and PAHs (including B(a)P) are now the FDEP SCTLs. The FDEP Residential SCTL for arsenic is 2.1 mg/kg and the FDEP Commercial/Industrial SCTL for arsenic is 12 mg/kg. The FDEP Residential SCTL for B(a)P is 0.1 mg/kg and the FDEP Commercial/Industrial SCTL for B(a)P is 0.7 mg/kg. The FDEP SCTLs were implemented in 2005 and have not changed.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No, the Additional RA completed in 2018 and 2019 removed previously identified soil with arsenic concentrations above the FDEP Commercial/Industrial SCTL of 12 mg/kg. In addition, B(a)P concentrations above the FDEP Commercial/Industrial SCTLs were also removed from the site except for at one area. However, exposure to the residual soil contamination above the FDEP Commercial/Industrial SCTLs is restricted by an engineering control, an active roadway (**Figure 17**). The boundary of the field constraint has also been added to the Site SS042/OU-31 LUC Site Inspection Program and will be inspected annually.

10.8 ISSUES

No issues were identified in this review for Site SS042/OU-31.

10.9 RECOMMENDATIONS

Arsenic and B(a)P concentrations in soil at Site SS042/OU-31 are above the FDEP Residential SCTL of 2.1 mg/kg and 0.1 mg/kg, respectively. Therefore, continuation of annual LUC site inspections and FYRs are recommended. One area within the site also contains B(a)P concentrations in soil above the FDEP Commercial/Industrial SCTL of 0.7 mg/kg. However, exposure to the residual soil contamination above FDEP Commercial/Industrial SCTLs is restricted by through an engineering control (**Figure 16**). While this engineering control restricts exposure to the residual soil contamination, it is located within property designated for future re-development and could potentially be removed. Therefore, verification that this constraint still

exist is to be conducted during the annual LUC site inspections. The field constraint boundaries and inclusion of its inspection in the annual LUC Site Inspection Program have been implemented at the site through the Former Homestead AFB Long-Term Management Work Plan (FPM, 2021c).

In addition, arsenic concentrations in groundwater at the site are also above the Federal MCL and FDEP GCTL of 10 µg/L; therefore, continuation of biennial groundwater monitoring is also recommended.

10.10 PROTECTIVENESS STATEMENT

The remedy at Site SS042/OU-31 is protective of human health and the environment.

10.11 NEXT REVIEW

Site SS042/OU-31 will be subject to the next FYR. The next FYR is due January 12, 2026.

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TABLES

FIGURES

APPENDIX A
FORMER HOMESTEAD AFB LAND-USE CONTROL IMPLEMENTATION INSTRUMENTS

APPENDIX B
SITE INSPECTION CHECKLISTS AND PHOTOGRAPHS

APPENDIX C
PUBLIC NOTICE COPY OF ADVERTISEMENT AND AFFIDAVIT

APPENDIX D
USEPA APPROVAL LETTER FOR FYR

Appendix will be added to Final

ATTACHMENT 1

FIRST FIVE-YEAR REVIEW REPORT FOR NON-CERCLA SITES, FORMER HOMESTEAD AIR FORCE BASE, HOMESTEAD, FLORIDA